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Railway Age

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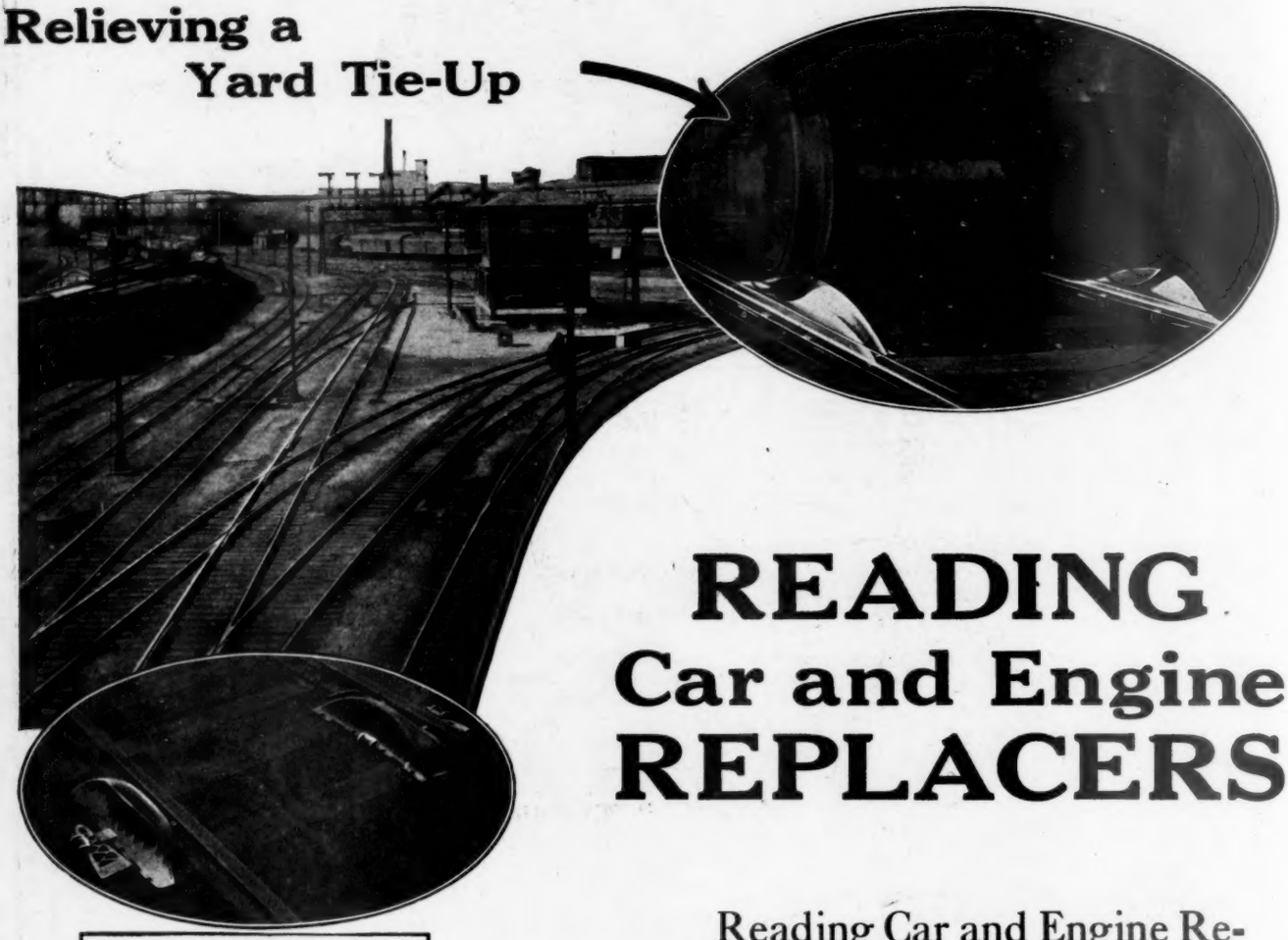
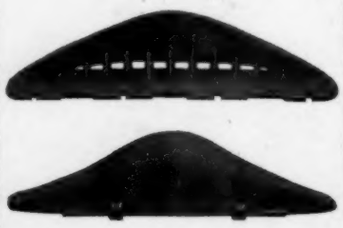
Alphabetical Index to Advertisements, Page 62 Classified Directory of Advertisers, Page 58

Relieving a Yard Tie-Up



READING
Car and Engine REPLACERS

VIEWS of INSIDE REPLACER



VIEWS of OUTSIDE REPLACER

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EDITORIAL

Railway Age

The Table of Contents Will Be Found on Page 5 of the Advertising Section

The shopmen's strike has now been under way for six weeks. It has had some adverse effects. These have been in evidence on some of the leading carriers serving non-union coal fields but latest reports are that congestion even on these roads is now being rapidly cleared up assisted in some cases by embargoes on traffic other than coal. On roads other than these, fast freight service—which is perhaps the best indicator of any—is not moving with quite its old time punctuality or regularity. It can hardly be said, however, that the delays are serious and certainly there is no approach whatever to anything like a crisis as to the transportation of perishable food supply. It seems rather safe to presume that most railroad managements a month ago would have considered themselves unduly optimistic if they had hoped that the operating situation would have been as good as the situation now happens to be at the end of that month. The newest development in the strikers' activity is their contention that there has been a rapid deterioration of equipment due to a failure to give it proper repairs. There may have been some deterioration but if in six weeks the strikers have failed to hinder passenger service or to slow down fast freight service any more than they have it looks as if the situation could not be much worse at the end of three times six weeks than it is now.

Service Continues Good

The use of concrete has become so universal on the railroads and in fact so much a commonplace in the day's work that cognizance is seldom taken nowadays of the fact that its manufacture is really an art, based on sound principles of science derived from voluminous experimental data, and representing an infinite amount of careful study by no means ended. There are many evidences of this. One that merits special attention, is the method by which a number of roads have been observed to proportion aggregates on construction. However strange it may seem to close students of modern concrete construction, it is nevertheless true while some railroads are giving close attention to the design of the structure in the office, even to specifying definitely the proportions of cement, sand and gravel they give a conspicuous lack of attention to the quality and proportions of the aggregate that actually are used. As an illustration of this, it is frequently observed that where definite proportions of cement, sand and gravel are called for in the specifications governing the work of contractors, concrete is actually made by mixing the cement with run of bank gravel which often contains strippings and without giving more than the crudest consideration to wide variations in the uniformity of the material not to mention a neglect of screening to insure correct proportioning. In fact on some jobs it has appeared that more thought was given to the salvaging of the cement sacks than to the proper use of their contents. Whatever might be said about the good results which have occasionally been obtained from this method of undertaking concrete construction, this practice may nevertheless be said to represent an attitude toward concrete construction (for which surprisingly large sums are spent annually) that will sooner or later work to the injury of any road countenancing it. It may indeed be theory to include in specifications requirements as to the proportioning of the aggregate and as distinguished from this it may be good practice to use bank run. But if the results which have been obtained in the past justify the specifying of proportions, as they have, it is obvious that good reasons still exist for the railroads to conform rigidly to a practice more nearly in conformity with the art than some of them now employ.

Theory and Practice in Concrete

One of the curious reactions to the railway shopmen's strike is the manner in which the strike has been regarded in financial circles. The facts of leading interest are that last week something like 20 leading railroad stocks advanced to new highs for the year. Among these stocks were the Chesapeake & Ohio, the Norfolk & Western and the Louisville & Nashville, all three of which have been rather badly hit by the shopmen's walkout. The reason for the favor which has been shown for the railroad issues is presumably in the main the favorable June earnings statements of a large share of the carriers. Insofar as concerns the C. & O., the N. & W. and the L. & N., the June statements were, of course, especially favorable because they reflected the heavy non-union coal traffic in June. Wall street, if one may revert to that expression, has come in recent weeks to look upon railroad stocks with a much more favorable attitude than formerly. Railroad issues have not had that same increase in price that industrial issues have had. Financial circles are, however, now turning their attention to the railroad stocks and to what the railroads are doing generally. The fact that they pay little or no attention to any possible adverse effects of the strike apparently indicates that they agree that the shopmen's strike has failed to hinder the railroads greatly in their start on a march to increasing prosperity.

Rail Strike and Financial Centers

There is no doubt that the stockholders of railroads as well as other corporations sustain large annual losses because mechanical methods are often over standardized, new labor-saving methods and machinery being introduced only with great difficulty. The older mechanical department officers and shop foremen, in particular, are liable to get in a rut, rely too much on precedent, and believe that certain operations must be correct because they have always been done that way. Realizing that hundreds of more or less impractical machines and methods are proposed each year, it is easy to understand the caution with which railroad men adopt anything new. There is no justification, however, for the point blank refusal to try a promising new machine or method simply because it is new. Neither should it be rejected because shop men think they know more about their business than any one else and have nothing to learn. If an open-minded attitude is maintained, valuable lessons can be learned from the specialists in similar kinds of shop work. In this connection it is safe to say that some railroads maintain too stringent a policy in keeping salesmen out of the shops, as these men often convey suggestions of immense practical

Avoiding Mechanical Ruts

value regarding carrying out the work. One of the important functions of the modern mechanical department is to avoid ruts, developing a policy of thorough investigation of the merits of new machinery and methods applicable to shop work. It is also the function of the department to show higher railroad officers the relation between modern labor-saving shop machinery and railroad net earnings.

The Proof of the Pudding

The many experiences which railways have had in adopting new ways of doing things or authorizing large expenditures for equipment on the strength of the glowing representations made by their advocates, only to find later that the results expected were not forthcoming, has quite naturally and rightly operated to put the roads constantly on their guard against newcomers. The necessity for the roads maintaining this attitude to avoid becoming the dumping ground for immature ideas does not, however, mean that they should close their minds to the ever-present possibilities of effecting economies or otherwise improving conditions to their own benefit, nor that they should not be always ready to consider the introduction of such methods or equipment as really offer some promise of substantial benefit. In view of this it is of interest to comment on the recent authorization by a large western railroad of the construction of nine new water treating plants and the remodeling of three others at an expenditure in excess of $200,000. This action has a two-fold significance, arising on the one hand, from the fact that a railroad has deliberately undertaken the construction of as many as nine new plants after having had several years' experience in water treating by various means, and arising on the other hand, from the fact of its remodeling a number of existing plants. Its action in building new plants is conclusive evidence of the continued belief of this road. at least in the efficacy of the process, and its action in remodeling existing plants affords evidence that treating plants, like other equipment established to do a certain work, are susceptible of improvement to keep pace with the development of the art. When it is considered that water treatment on railroads is still comparatively in its infancy and that some roads have not yet seen fit to interest themselves aggressively in it, these two points command attention. As ever, the proof of the pudding is in the eating, and when one road is found building treating plants upon the strength of the service obtained from others, it is reasonable to conclude that similar results may be obtained elsewhere.

Line Wire Crossings

Because of the rapidly increasing number of cross country transmission lines, in addition to the growing net work of public telephone systems, the railroads should be seriously interested in the character of the construction of these lines at the crossings with their communication and signal pole lines. Interference between power lines and railroad telegraph or signal control wires results in serious delays to traffic, to say nothing of the danger to employees. If a road operates a high tension a.c. signal line on the right of way that could become crossed with public telephone lines, the railroad may also be liable for damages resulting therefrom. These problems have received serious consideration from various state bodies, the American Railway Association and the Bureau of Standards. The A. R. A. specifications call for heavier construction for telegraph lines at power line crossings than is deemed necessary in the National Electrical Safety Code issued in 1920. The specifications of the Telegraph and Telephone Section of the A. R. A., adopted in 1922, are at variance with the code in respect to the number of wires which may be carried by an unguyed pole and also with reference to the limits on wire sag. The introduction of legislation recently in several different states relative to wire crossings has called for an unusual amount of time and information from railroad telegraph and signal officers and representatives of the communication and public utilities organizations. In order that the National Electrical Safety Code may serve as the basis for legislation in these states with minimum changes and conferences, the American Engineering Standards Committee is now forming a representative committee to consider the revision of the code dealing with wire crossings. There are several important matters for the railroad representatives to keep in mind in this revision, among which would be the elimination of the differentiation between the construction of power lines over main lines, branches and sidings. The railroad communication lines should be equally as well protected from public utilities power lines regardless of the number of trains or the size of the telegraph leads. The code, no doubt, will be adopted in whole or part as the law in numerous states, and the several sections of the A. R. A. and the railroad officers concerned might well follow the action of this proposed committee in order that the interests of the railroads may be guarded in the changes made in the code at this time.

Railroad Shop Transportation Facilities

It is a common saying that a carpenter is too busy to attend to small repairs about his own house or even to fix his roof until it leaks so badly as to be decidedly uncomfortable. In the same way it often looks as though a railroad was so busy furnishing or preparing to furnish transportation facilities to the public that no time was found to attend to the strictly local transportation problems around its own shops and terminals. Such a group of buildings, many of them often of considerable size, is frequently spread out over a large area. When the plant is laid out provision is made for standard gage tracks at the sides of the buildings and leading into them so that a car of coal can be delivered to the power house or alongside the blacksmith shop, or a car of couplers to the freight car shop. But what are the provisions for moving the coal from the bin to the various furnaces or for delivering the couplers at the car to which they are to be applied? Shops must have an adequate supply of standard gage tracks. At certain shops these have been supplemented by a well planned system of narrow gage industrial tracks which has aided greatly the distribution of materials. In the majority of cases, however, the only rolling stock provided is composed entirely of hand-pushed cars. Where tracks are well laid out a small storage battery locomotive or a platform car, self-propelled and with sufficient surplus power to haul several other small cars, would aid considerably in expediting deliveries and in reducing the costs of moving materials. In storage battery or gasoline engine industrial trucks and tractors a most convenient means of transportation is now available. Because of their flexibility and speed they can be used to great advantage even in shops which already have a system of industrial tracks. In order that they may be used to the best advantage it is important that the aisle space be of good width, well defined and kept free from obstructions. Suitable concrete walks or passage-ways also should be laid out to connect the various buildings. The whole problem of shop transportation is a large one and needs careful study, preferably by an expert. How many shops are there which have what may properly be called a real transportation system? The system and its equipment having been provided, the results obtained will then depend upon its operation. The selection of routes, the frequency with which they are covered and other problems of a similar character should be easily solved provided a suitable man is selected who is given full charge of the traffic.

President Harding's Second Strike Plan

PRESIDENT HARDING'S first plan for settling the shop employees' strike was "accepted" by the labor leaders with reservations that amounted to a rejection of it. Their answer to his proposal that railway managers and workmen should agree to recognize the validity of decisions of the Railroad Labor Board and faithfully carry them out clearly reserved to the employees the right to strike rather than carry out the Board's decisions. The railways accepted all parts of the President's plan except that which provided for taking back the strikers with their full seniority rights.

The definite rejection by the railway executives of the President's proposal regarding seniority rights has resulted in his submitting to the labor leaders and the railway executives a second plan. That is, that the strikers shall return to work, the railways shall give them employment, and the question of seniority rights shall be submitted upon its merits to and be decided by the Railroad Labor Board. Of course the President's second plan, like his first, involves, although he does not say so, rehearing by the Labor Board of the wage case and regarding the rules adopted by it to which the labor leaders object. The President's second plan was promptly rejected by the labor leaders. The meeting of the railway executives called to consider it was held too late for its outcome to be reported in this week's issue of the *Railway Age*.

It is the opinion of the *Railway Age* that the President's second plan is the only one he could have suggested which would have been consistent with the views he expressed in his letter to Chairman Cuyler of the Association of Railway Executives. The fundamental issue presented by the shop employees' strike is whether controversies between the railways and their employees are to be settled by arbitration by the Railroad Labor Board, or by strikes. The plain purpose of the labor provisions of the Transportation Act was to prevent strikes by causing every controversy which might result in a strike to be settled by decision of the Labor Board. If employees are to strike rather than accept any and every decision of the Board they do not like, then the labor provisions will fail to accomplish their purpose, and had better be repealed and the Labor Board abolished. In this instance, the labor provisions did fail of their purpose, and the supposed preventive of strikes has proven worse than the disease. It has delayed changes in working rules and reductions of wages which should have been made months before, it has not prevented a strike, and it has not made the strike any easier to settle.

The raising of the seniority issue and its becoming the principal obstacle to the settlement of the strike were inevitable results of the strike. Most of the railways could not hope to maintain normal operation without keeping many of their old shop employees and getting many new men. They could not do this without promising these men regular employment, and they could not assure them regular employment without promising them seniority rights. Once the question of seniority rights had been raised, it was a foregone conclusion that it could be settled only either first, by a complete victory for one of the combatants, or secondly, by some kind of arbitration, the performance of which function should naturally be delegated to the Railroad Labor Board. To settle the question arbitrarily in favor of either side would be to disregard the Railroad Labor Board, minimize its functions, reduce its authority and impair its prestige. On the other hand, to submit to it every issue involved, whether an issue which helped cause the strike, or one which is a direct outgrowth of it, will tend to do the very thing the President said he desires to do; viz., "establish the unchallenged authority of the Railroad Labor Board" and thereby help to make it a useful agency in "maintaining industrial peace in railroad service."

Neither the railroads, nor the employees now at work, nor those who have struck, can reasonably refuse to submit the seniority issue to the Railroad Labor Board, because this involves submitting to an impartial body on which all parties in interest are represented the determination of the question of what actually are the rights of each party. Anybody who says that this cannot be done with fairness to all says, in effect, that there is no fair way except by the use of force to settle such controversies, which is equivalent to saying that civilized society has discovered a kind of controversy that certain of its members cannot fairly settle in any way except by the uncivilized method of submitting it to the arbitration of force and violence. Any group of men who take the position that they have rights which are so clear and so paramount to those of all other members of society that the determination of whether they actually possess those rights cannot more fairly and safely be left to some form of judicial arbitrament than to the arbitrament of force take a position which no civilized society can tolerate with justice to other parties in interest, or with safety to itself.

It cannot reasonably be assumed that the Railroad Labor Board or any other governmental body performing judicial or semi-judicial functions always has or always will perform them with perfect fairness. But the Railroad Labor Board, or any other governmental body performing judicial or semi-judicial functions is much more likely, in the long run, to do approximate justice as between the parties to a controversy than either party is to do justice to the other. Both parties to the strike have agreed to submit to rehearing by the Board of the controversies which caused the strike, and the Board is just as competent to settle fairly questions which have arisen as a result of the strike as those which caused it.

The coal strike and the railroad shopmen's strike afford the most powerful arguments ever afforded in this country in favor of the public, in the interest of justice and for its own protection, adopting and rigorously enforcing measures which will require all labor controversies in essential industries to be submitted to arbitration and which will compel the parties to such controversies to accept and faithfully carry out the arbitration awards.

The "Crimes" of the Railways

SO MUCH PROPAGANDA has been disseminated from labor union sources alleging wholesale violations by the railways of the labor provisions of the Transportation Act and the decisions of the Railroad Labor Board, that it is time the public was given a plain statement of the actual facts.

The facts given in this editorial will relate only to cases affecting the shop crafts, since they are the employees who have gone on strike and offered offences committed by the railways as a reason for doing so. The facts which will be presented are taken from records compiled by and for the Railroad Labor Board, and public members of the Board are the *Railway Age's* authority for stating that the cases we shall mention are the only cases involving alleged violations by railways of the law or directions of the board, which have been brought to the attention of the board.

There are over 200 Class I railways. How many of these are involved in these alleged violations? Exactly 24. How many violations of the law or decisions of the board have been charged against these 24 carriers? The number of the alleged violations is 34. What is the nature of the alleged violations? Twenty-two out of 34 cases involve the contracting of work by 17 different railways. These railways had 12 per cent of the total mileage of all the Class I railways. Therefore no contracting of work has been complained of upon railways having 88 per cent of the total mileage. All these railways engaged in contracting work before there had ever been a decision by the Labor Board regarding whether it was legal or even desirable. Since the board rendered its decision all the railways but two have

indicated to it that they will quit contracting out work. These two railways have a mileage of 2,691 miles, which is 1.2 per cent of the total mileage of the Class I carriers.

There are seven railways which have been charged with making reductions in wages not authorized by the Labor Board. The total mileage of these railways is 4,460 miles, or about five per cent of the total mileage of the Class I railways. There have been four cases involving alleged violations of rules and working conditions fixed by the Labor Board, but they are all cases of minor importance and in not one of them has a decision been rendered by the Labor Board. The foregoing is the sum total, as shown by the records of the Labor Board, of all the outrageous violations of the law and of decisions of the board which the leaders of the shop crafts unions could truthfully charge against the Class I railways as justification for ordering the present strike.

The propaganda the labor leaders have disseminated regarding alleged violations of the law and the decisions of the Labor Board committed by the railways, is precisely similar in character to all the other propaganda that they carry on for the purpose of misleading the public.

Labor Leaders Did Not Accept President Harding's First Plan

ONE OF THE MOST astounding illusions that ever prevailed in the United States is the illusion that the railway shop crafts unions accepted President Harding's first plan for settling the shop employees' strike. They did not accept it any more than the railways did.

President Harding made three proposals as a basis for settling the strike. The railways rejected the third of these proposals—that relating to seniority rights. The labor unions rejected the first, which related to the attitude to be assumed in future by railways and employees toward decisions of the Railroad Labor Board. President Harding in his letters transmitting his second plan to the railways and the labor leaders expressed gratification that both of them had agreed to accept and carry out decisions of the board in future. But the labor leaders in their reply to the President's first proposal expressly reserved the right to order strikes in future against every decision of the Labor Board which may be "non-acceptable" to them.

The first of the terms of agreement presented by the President was stated in his own language as follows:

"First, railway managers and workmen are to agree to recognize the validity of all decisions of the Railroad Labor Board and to faithfully carry out such decisions as contemplated by law."

President Harding must have meant when he wrote these words that the former employees belonging to the shop crafts unions, as one of the conditions of settlement of the strike, should agree not to strike rather than accept decisions of the board in future. Otherwise his presentation of this proposal to the employees would have been meaningless, for it is only by striking that they can refuse to accept and carry out its decisions. The following is the language in which the labor leaders "accepted" this proposal, the italics used being ours:

"The employees have always taken the position that *as long as they continued to render service* they should abide by the rules and working conditions and accept the wages agreed upon by proper negotiation or determined by the Labor Board after hearing of a dispute upon any of these matters. They respectfully point out again that violations of law and refusals to comply with decisions of the Labor Board have been exhibited only by the railway managements, and that it *has been universally admitted that the employees, in exercising their right to suspend work upon non-acceptable conditions, were neither violating the law nor the decisions of the Board.*"

Now, everybody who ever read the labor provisions of the Transportation Act knows that if it is a violation of law for a railroad to refuse to comply with any decision of the board, then it is equally a violation of law for any group of railway employees to refuse to abide by any decision of the board. When Mr. Jewell and his associates said it had been "universally admitted that the employees, in exercising their right to suspend work upon non-acceptable conditions, were neither violating the law nor the decisions of the board," he stated that something had been "universally admitted" which never has been admitted by anybody outside of the labor unions.

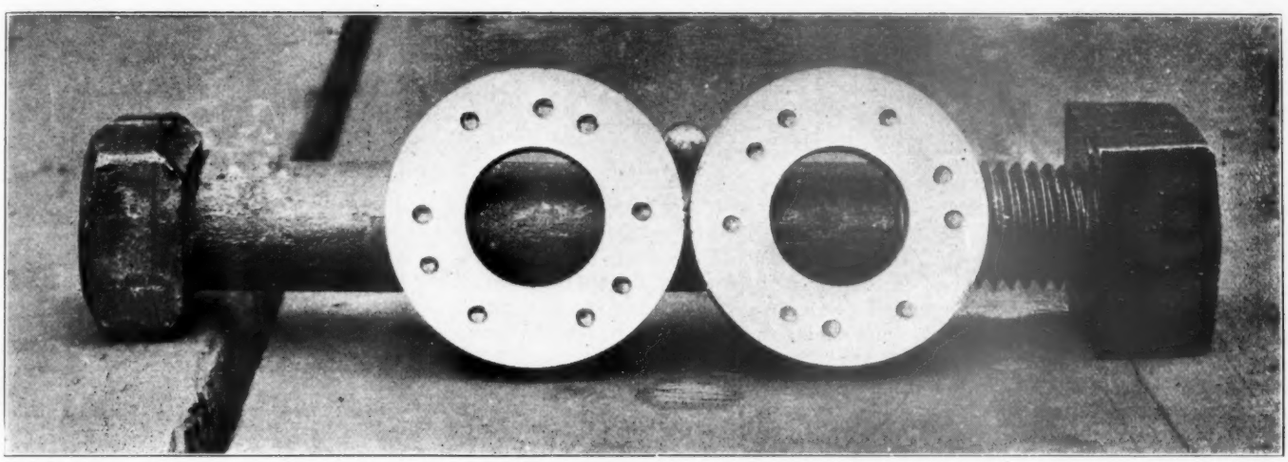
But what do these phrases, "as long as they continued to render service" and "exercising their right to suspend work upon non-acceptable conditions," mean? They mean simply that the labor unions demand that the railways shall accept and carry out every decision of the Railroad Labor Board, while the labor unions themselves reserve for themselves the "right" to strike at any time against any and every decision of the board which imposes "non-acceptable conditions" and that they even claim when they do this they are not violating the very decision of the board against which they strike! The railway executives accepted this proposal of the President, but with the understanding that it was not intended to preclude any party to a controversy from taking a decision or order of the board into court to determine whether it actually is valid.

President Harding said in his letter of July 31 to Thomas DeWitt Cuyler, chairman of the Association of Railway Executives: "It is wholly unthinkable that the Railroad Labor Board can be made a useful agency of the government in maintaining industrial peace in railway service unless employers and workers are both prompt and unquestioning in their acceptance of its decisions. I feel it is more desirable than I know how to express to have established the unchallenged authority of the Railway Labor Board because we must do those things which are necessary to bring about recognition of suitable authority to decide and end such disputes as menace the continuity of transportation." If any interpretation of the President's first proposal were needed, the language here used by him would afford it. He is seeking to make the Railroad Labor Board a useful agency in "maintaining industrial peace in the railroad service" and as a means to this end he asks employers and workers both to be "prompt and unquestioning in their acceptance of its decisions." But can it be said that a group of railway employees which expressly reserves the right to "suspend work upon non-acceptable conditions" established by the Labor Board is showing any disposition whatever to be "prompt and unquestioning in its acceptance" of the decisions of the board?

It is only too plain that the labor leaders, in pretending to "accept" the President's plan, accepted only two parts of it. The first part they accepted was that which provided that the railways should withdraw all lawsuits against the labor unions or their members growing out of the strike. The second of the terms they accepted was the President's suggestion that the striking employees should be allowed to return to work with their seniority rights unimpaired. In other words, they agreed to those parts of his plan which provided that the railways should make concessions, but rejected the most important part of it, namely, that which was designed to promote industrial peace in future.

There was much astonishment felt by railway officers that the President ever could have believed the railways would accept the first plan which he proposed for settling the strike.

There is even more reason for astonishment, however, that he or anybody else could have believed, after reading the labor leaders' letter to him, that they had accepted this plan.

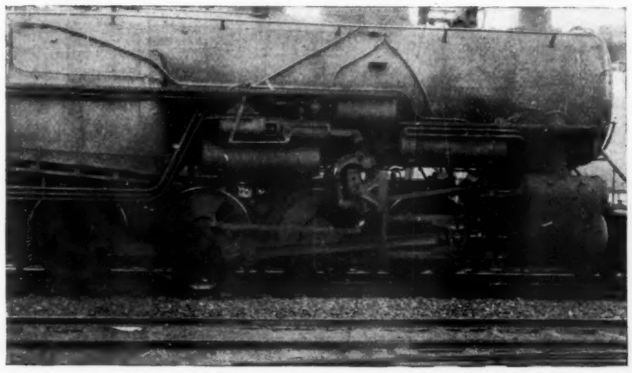


Two of the Washers Showing the Impressions Made by the Brinell Balls

Determining the Impact Loads on Track Bolts

Interesting Tests Performed on Philadelphia & Reading to Evaluate and Compare Induced Stresses

SOME INTERESTING TESTS were carried out recently to determine the stresses in track bolts induced by the impact of trains and locomotives and the pull of a trackman on a wrench. A separate test was also made to secure the breaking strength of a track bolt installed under the same conditions. These tests were conducted on the Philadelphia & Reading by the National Lock Washer Company, Newark, N. J., working with the officers of the railroad. The load caused by the impact was measured by an adaptation of the Brinell system of testing hardness, the impact or pull of the wrench forming depressions in hardened steel washers from which the stresses were determined. The average minimum and maximum loads were 25,980 lb. and 29,298 lb., giving stresses on the one-inch bolts used of 47,236 lb. per sq. in. and 53,270 lb. per sq. in. respectively.



The Locomotive Stopped Over the Joint to Show Position of Counterweight

The underlying principle of the method consisted of the forming of impressions upon hardened steel washers, through the medium of standard Brinell balls, by the loads which it was desired to determine. The equipment, which was developed, is shown clearly in the illustration and was for use with a four-hole joint. It consisted of four standard untreated one-inch bolts such as are used in insulated track joints (the standard track bolt being too short); four coned filler blocks with an angle of 41 deg. from the largest diameter face; eight hardened steel washers, 2¼ in. in diameter and ⅜ in. thick, four 3-ball retaining washers, two steel bars used to prevent the washers from turning and the necessary nuts and Brinell balls. Washers were made from crucible steel, about 0.90 carbon, heat treated by quenching in oil at 1550 deg. Fahr. and drawing at 600 deg.

The field tests were made on the southbound, high-speed main track of the Philadelphia & Reading at a point opposite tower "PW," slightly over 2½ miles north of Norristown Junction, Pa. The track at this point was laid with the Pennsylvania Steel Company's Section 165, open hearth, 100-lb. rail on tie-plated, creosoted pine ties, on stone ballast with good line and surface and four hole, reinforced angle bars.

The Test Apparatus Installed in Track

The old bolts were removed from one of the angle bars by a section man, after which the test arrangement was put in place, the new bolts being numbered 1, 2, 3 and 4 in the direction of travel. The nuts were then pulled up by the section man, using a 36-in. track wrench and applying, as nearly as possible, a normal amount of force. This was done in preparation for train No. 92, a high-speed passenger train which passed over the joint a short time after, at 58 miles an hour. The equipment consisted of a fairly heavy Atlantic

A TABLE SHOWING THE RESULTS OF THE IMPACT TESTS

Washer position, No.	Washer No. 1: Diameter of impression 1	2	3	Average M.M.	Average Ins.	10,000 lb. test impression diam. M.M.	10,000 lb. test impression diam. Ins.	Pressure per sq. in. $H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$	Load on each washer impression made in joint	Washer No. 2: Diameter of impression 1	2	3	Average M.M.	Average Ins.	10,000 lb. test impression diam. M.M.	10,000 lb. test impression diam. Ins.	Pressure per sq. in. $H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$	Load on each washer impression made in joint	Sum of impression loads determined for Washers No. 1 and No. 2	Average of impression loads determined for Washers No. 1 and No. 2	Determined load placed on each bolt for each washer position	Remarks
				BOLT No. 1									BOLT No. 1									
1	3.4	3.5	3.4	3.43	.1350				8084	3.0	3.0	2.8	2.93	.1153				8906	16990	8495	25485	Passenger train
2	3.7	3.5	3.6	3.60	.1417	3.8	.1496	547,395 lb.	8930	3.0	3.0	2.9	2.96	.1165	3.1	.1220	834,376 lb.	9102	18032	9016	27048	Freight engine
3	3.9	3.3	3.0	3.40	.1338				7935	3.0	3.1	2.9	3.00	.1181				9350	17285	8643	25929	Wrench pull
4	4.0	3.4	3.7	3.70	.1457				9458	3.2	3.2	3.1	3.16	.1224				10073	19531	9766	29298	Breaking bolt
				BOLT No. 2									BOLT No. 2									
1	2.9	2.9	2.8	2.86	.1126				8483	3.0	2.8	2.9	2.90	.1141				8720	17203	8602	25806	Passenger train
2	2.9	2.7	2.8	2.80	.1102	3.1	.1220	834,376 lb.	8122	2.9	2.9	2.7	2.83	.1114	3.1	.1220	834,376 lb.	8297	16419	8210	24630	Freight engine
3	2.9	2.7	2.8	2.80	.1102				8122	2.9	2.8	2.7	2.80	.1102				8122	16244	8122	24366	Wrench pull
				BOLT No. 3									BOLT No. 3									
1	3.2	3.8	3.5	3.5	.1378				10000	2.9	3.0	3.0	2.96	.1165				9102	19102	9551	28653	Passenger train
2	3.3	3.1	3.2	3.2	.1260	3.5	.1378	649,392 lb.	8313	3.0	3.0	2.8	2.93	.1153	3.1	.1220	834,376 lb.	8906	17219	8610	25830	Freight engine
3	3.5	3.1	3.7	3.43	.1350				9590	3.0	3.0	2.9	2.96	.1165				9102	18692	9346	28038	Wrench pull
				BOLT No. 4									BOLT No. 4									
1	3.0	2.9	3.0	2.96	.1165				8522	3.0	2.9	2.9	2.93	.1153				8906	17428	8214	24642	Passenger train
2	3.0	3.4	3.0	3.13	.1332	3.2	.1260	781,189 lb.	9556	3.2	2.9	2.8	2.96	.1165	3.1	.1220	834,376 lb.	9102	18658	9329	27987	Freight engine
3	3.0	2.8	3.0	2.93	.1153				8338	3.0	2.9	2.8	2.90	.1141				8720	17058	8529	25587	Wrench pull

	Average		Average
Passenger train	26145 lb.	Wrench pull	25980 lb.
Freight engine	26374 lb.	Breaking pull	29298 lb.

type engine with a weight on drivers of 129,210 lb.; a combination car, three day coaches and two Pullmans.

After the passage of this train, the nuts were loosened, the impressions marked for future identification and the washers turned through a small angle to secure a new bearing surface for the balls. The nuts were then turned up and a heavy Consolidation engine running light at 45 miles an hour, was run over the joint. The weight on the drivers of this locomotive was 251,920 lb., the weight on the third pair of drivers being 64,690 lb. The drivers were 53½ in. in diameter. The locomotive was stopped gradually, backed up to the joint and stopped with the third pair of drivers exactly over the joint to locate the position of the counterweight. The joint was neither subjected to a maximum nor a minimum stress but one more nearly approaching an average.

Following this test, a new surface was again brought into position and the nuts tightened by the same section man to secure the load produced by the pull of the wrench. Another surface was brought into position after this had been done and a nut on one of the bolts tightened until it broke. The hardened washers, carefully marked for identification, were taken later to a testing laboratory where each washer was subjected to a test load of 10,000 lb., using a Brinell ball of the same diameter employed in the field test. This was done to determine the unit resistance to pressure of washer from which the actual field loads could be calculated.

The load, as indicated by the units of three impressions on each washer, was calculated separately after which the results for the two washers on the individual bolts were averaged to secure the load. The final loads were determined from an average of the loads on each bolt. The results give a stress of 26,145 lb. on a one-inch bolt resulting from the passage of the passenger train, 26,374 lb. for the free-running freight locomotive, 25,980 lb. for the wrench pull and 29,298 lb. for the breaking pull. This gives stresses per sq. in. of approximately 47,536 lb., 47,952 lb., 47,236 lb., and 53,270 lb. respectively, using 0.550 sq. in, as the area at the root of the thread. The formulas follow:

$$H = \frac{P}{2\pi r\left(r-\sqrt{r^2-\frac{D^2}{4}}\right)}$$

$$P_1 = 2\pi r H \left(\sqrt{r^2-\frac{D_1^2}{4}}\right)$$

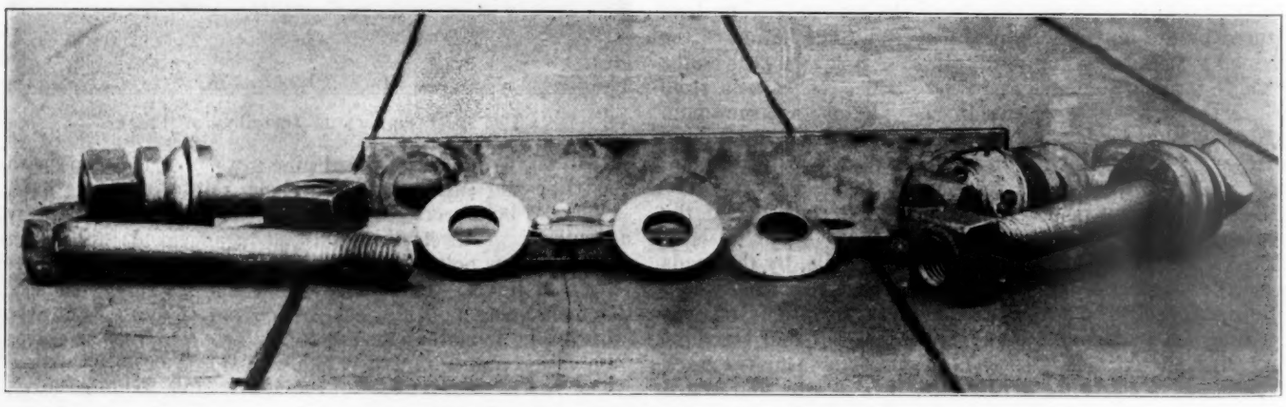
H = Unit pressure on surface of ball impression made by test load or unit pressure resistance of material in washer.

P = Pressure on ball making test impression = 10,000 lb. P_1 = Pressure on ball to make track impression.

r = Radius of ball—5 m.m. in each case.

D = diameter of impression made by test load of 10,000 lb. in each class. D_1 = Diameter of impression made when washers were on track bolts.

The test described here was conducted under the direction of J. Howard Horn, National Lock Washer Company, Newark, N. J., and R. B. Abbott, assistant general superintendent, and J. S. Goodman, division engineer of the Philadelphia & Reading.



The Complete Equipment Used in the Track Test

President Proposes New Plan to Settle Strike

Asks Unions to Call Off Strike and Roads to Take Men Back, Leaving Seniority Question to Labor Board

WASHINGTON, D. C.

AFTER HAVING maneuvered both the railway executives and the federated shop craft unions into an agreement to recognize the validity of decisions of the Railroad Labor Board, President Harding on Monday proposed a new plan for a settlement of the railroad strike by a submission of the respective seniority rights of the strikers, the loyal employees who remained at work and the new employees to the Labor Board for a decision.

This proposal, which contemplates that the strikers return to work and that the railroads take them back, was embodied in nearly identical communications sent by wire to Thomas DeWitt Cuyler, chairman of the Association of Railway Executives, in New York, and by messenger to B. M. Jewell, president of the Railway Employees' Department of the American Federation of Labor, who was in Washington, about noon on Monday. The President then called the newspaper correspondents to the White House, where they were given copies of the messages with a brief explanatory statement that after great reflection and thorough investigation of all avenues of adjustment the plan of referring to the Labor Board the only remaining dispute in the way of a settlement "seems the only practical course for the government to take" and that "this is done as rather a final call, mindful of all existing conditions" including the threatened paralysis of transportation affecting many varieties of seasonal traffic and "the very great inconvenience and menace which threatens general industry through the fuel situation," and as representing "the best judgment of the government, stand-

Text of the President's Second Proposal

B. M. JEWELL:

I had your communication in which you and your associates, speaking for the striking railway shopmen pledged your agreement to the proposals which I submitted to the railway executives and your organizations for the settlement of the pending railroad strike. Inasmuch as I was acting as a voluntary mediator, seeking the earliest possible settlement, I confess to you the same disappointment which I have conveyed to the executives that the terms were not unanimously accepted. As you are already aware the executives of the carriers declared their inability to restore seniority rights unimpaired.

It is exceedingly gratifying, however, that in responding to the terms which were proposed that both the spokesmen for the carriers and the spokesmen for the employees have pledged that they "will recognize the validity of all decisions by the Railroad Labor Board and to faithfully carry out such decisions as contemplated by the law." Moreover, spokesmen for carriers and employees have approved the second paragraph of the proposal and in their approval have agreed that "Railroad Labor Board decisions which have been involved in the strike may be taken, in the exercise of recognized rights, by either party, to the Railroad Labor Board for rehearing."

Inasmuch as the employees have agreed to all the terms proposed and the executives have agreed to two of the bases of settlement and rejected the third, there remains only the question of seniority covered in paragraph three in dispute, to bar a settlement. Mindful of the pledge of both the executives and the striking workmen to recognize the validity of all decisions by the Railroad Labor Board I am hereby calling on the striking workmen to return to work, calling upon the carriers to assign them to work, calling upon both workmen and carriers, under the law, to take the question in dispute to the Railroad Labor Board for hearing and decision and a compliance by both with the decision rendered.

WARREN G. HARDING.

T. DEWITT CUYLER:

I had your communication in which you conveyed to me the resolutions of your association agreeing to two paragraphs in the proposal which I submitted for the settlement of the pending strike of railroad shop employees, and declining to accept the third, which provided for restored seniority rights of the workmen on strike. Inasmuch as I was acting as a voluntary mediator, seeking the earliest possible restoration of railway transportation to full efficiency, I confess a disappointment that the terms were not accepted.

The resolutions which you transmit on behalf of the executives do pledge that the carriers "will recognize the validity of all decisions of the Railroad Labor Board, and to faithfully carry out such decisions as contemplated by the law." You convey the further agreement, as expressed in the second paragraph of the proposal, that "Railroad Labor Board decisions which have been involved in the strike, may be taken in the exercise of recognized rights, by either party, to the Railroad Labor Board for rehearing."

The striking employees agreed to all the terms proposed, therefore only the question of seniority, covered in paragraph three, which the executives rejected, remains in dispute and bars a settlement. Mindful of the pledge of both the executives and the striking workmen to recognize the validity of all decisions by the Railroad Labor Board, I am hereby calling on the striking workmen to return to work, and calling upon the carriers to assign them to work, and calling upon both workmen and carriers under the law, to take the question in dispute to the Railroad Labor Board for hearing and decision, and a compliance by both with the decision rendered.

WARREN G. HARDING.

ing between the two contending forces and seeking an adjustment in the public interest."

The President had conferred for an hour or so on Saturday with Mr. Jewell, W. H. Johnston, president of the International Association of Machinists, and J. P. Noonan, president of the Brotherhood of Electrical Workers, and they had remained in the city and called on the President again on Monday prior to the announcement, but it was stated at the White House that he was not in a position to say what would be the attitude of labor toward the new proposal and that he had had no formal conference with any one representing the executives. It was said that "this is the government's own motion, it is not a partisan appeal, and the President hopes it will meet with public approval."

The plan is in accordance with the President's purpose as expressed on several occasions to uphold the authority of the Labor Board as the final arbiter of all disputes between the railroads and their employees. Although the President had expressed great disappointment that his original plan had been rejected by the railroads he was represented as attaching far greater importance to the acceptance of the principle of recognizing the authority of the Board.

Association of Railway Executives Meets Friday

Mr. Cuyler, who was at Bar Harbor, promptly called a meeting of the member roads of the Association of Railway Executives for New York on Friday. A meeting of the strike leaders was also called to be held at Washington on Wednesday. It was stated, however, that any decision reached at this meeting would probably be withheld until after a conference of the executives of all the railroad labor organizations on Friday.

Unions Oppose New Plan

While it was at first assumed that, as before, the President had reason to believe that his new plan would be acceptable to the shopcraft leaders, it soon became evident that they were as much opposed to the idea of calling off the strike without being assured of seniority for the strikers as the executives had been to the idea of completely surrendering the rights of their present employees. What they now want is that the President should get the Labor Board to assume jurisdiction over the seniority question before the strike is called off, and without waiting for it to be submitted as a joint dispute. The first move of the strike leaders after receiving the President's message was to call upon the train service and other railroad labor organizations for help and at the same time they apparently began a campaign of trying to alarm the public by declaring that railroad equipment is in an unsafe condition.

General Conference of Railroad Labor Leaders Called

Messrs. Jewell, Johnston and Noonan issued a statement Monday evening announcing that they had requested a conference of all executives of railroad labor organizations to be held in Washington on Friday and in their telegram to the labor executives said, "it is now apparent that no constructive program is being proposed."

Before asking for the general meeting of labor leaders they had conferred with the legislative agents of the engineers, firemen and trainmen. The statement said:

"We have requested this conference because we recognized that railroad employees not now on strike will, in defense of the traveling public and themselves, necessarily have to decline to operate the defective locomotives and cars now in service.

"It is clear to any unbiased person that railroad equipment is growing more unsafe each day, and the relief must be had through an honorable settlement. Employees now on strike are firm in their position and will continue as long as the Association of Railway Executives declines to accept reasonable terms of agreement."

The message to Warren S. Stone, as chairman of the Labor leaders, was as follows:

"Shop crafts did everything conceivable to avoid the necessity for a strike and since the strike have at all times been willing to confer with any party authorized to submit a proposal as a basis for honorable settlement. We accepted the President's terms of agreement submitted to employees and managers July 31. The Association of Railway Executives in rejecting the President's terms of agreement, obviously acting under the direction of those who exercise financial control and dictate the labor policies of the railroads, repudiated the promise given by their chairman to the President and defied the spokesman of the American people. To date, only the employees have made concessions. Obviously the strike must be settled if the country is to avoid the impending calamity of a collapse of transportation. The government has the authority to promptly settle the strike on the just, fair and reasonable basis proposed by the President July 31.

"However, it is now apparent that no constructive program is being proposed, and that unless the railroad employees can offer additional counsel and advice, the lives and safety of employees and traveling public, already endangered by the continued use of defective railroad equipment, will be imperiled to a greater extent.

"Believing that the chief executive of each of the standard railroad labor organizations, as a result of their years of experience, broad public viewpoint and sincere desire for industrial peace, can, by conference with the officers of shop crafts formulate a program having for its purpose protection of the public, preservation of the railroad industry and an honorable basis of settlement for the managers and the employees, we urgently recommend that you, as chairman of the railroad organizations, wire each chief executive requesting him to attend a conference in Washington on Friday, August 11."

Mr. Stone replied on Tuesday that the heads of all the organizations except the train service brotherhoods were in Washington or on their way and that they would be present on Friday.

Mr. Jewell has inaugurated a series of twice a day conferences with newspaper men and on Tuesday he exhibited a large number of telegrams from local organizations insisting that they would not "stand for" leaving the seniority question to the Board and that they would accept only the President's proposal of July 31. Mr. Jewell said that his message to Mr. Stone carried no suggestion of a general strike, but that the meeting was for the purpose of obtaining advice and counsel. Regarding the seniority question, he said that in the past whenever a strike had been settled it had been taken for granted that the men were to retain their seniority. When he was reminded that the present strike is the first nation-wide strike and that the situation differs from that involved in previous settlements because while some roads could take back the strikers without difficulty, many others consider that they have already defeated the strikers, he declined to admit that any road has beaten the strike and took the position that the new men employed by the roads are "no good."

One of the obstacles to the acceptance of the plan by the unions is the Labor Board resolution of July 3 which recognized the present employees rather than the strikers as the real employees of the railroads, and which the Board attempted to tone down by its action on August 7. The fact that the resolution had been adopted increases the unwillingness of the strikers to take their chances by trusting their seniority rights to the decision of the Board and they resent bitterly the idea which they consider represents the attitude of the government that they cannot be strikers and employees at the same time.

House to Be in Session

The strike situation was discussed by the Cabinet in a general way on Tuesday but no results were announced and the President declined to give any indication as to what course he would pursue if the latest plan is rejected. It was stated, however, that the House of Representatives would be kept in session after the members return on August 15. There had been some discussion of a series of short recesses

that would permit many of the members to stay away but it was stated that it was considered wise to have Congress on the job because "there is no disguising the seriousness of the coal situation and perhaps the seriousness of the railroad situation." This was taken by the newspapers to mean that the President had a legislative plan to propose. There has been some consideration of amendments to the Transportation Act to strengthen the authority of the Labor Board for the future but no definite plan for meeting the present railroad situation by legislation has been suggested.

White House Says Cuyler Saw Plan in Writing

That there was no modification of the terms of the President's proposal for a settlement of the shop strike between the time of his personal talk with Mr. Cuyler on July 27 and the formal statement of the plan in his letters to Mr. Cuyler and Mr. Jewell, except the change in the second part of the plan, relating to a rehearing before the Labor Board to which he called attention in the letter to Mr. Jewell, was stated officially at the White House on Friday. This was in response to suggestions that appeared in the press to the effect that the President's proposal on the seniority question came as a bombshell to the railway executives at their meeting in New York on August 1, for the reason that some change had been made in the plan. There was a very marked difference in the plan as formally announced and the unofficial forecasts of it that had appeared in the newspapers and attributed to official sources, but the President authorized the newspaper men to quote him as saying that "in a matter of such importance or in any of his official transactions he never permits a misunderstanding or makes a misrepresentation." It was stated that there was a change in part 2 of the plan, wholly voluntary on the President's part, because it was contrary to the original proposal, and that the President had pointed this out in formally communicating the plan to Mr. Jewell, but that Mr. Cuyler saw the proposal in writing at the time of his personal conference with the President and that there was no change thereafter in the part relating to seniority. Newspaper men had been told at the White House on July 28, at the time it was announced that the President had a plan to propose, that it had not been completely formulated, and Mr. Cuyler had been quoted in New York as saying that when he left Washington it had not been drafted. No information was given out at the White House regarding the terms of the plan until one o'clock Tuesday afternoon, after it had been submitted to the railway executives in New York, but the stories printed to the effect that the employees remaining at work would be given seniority above the strikers certainly received some encouragement, if not inspiration, in official circles and the statement indicating that Mr. Cuyler and Mr. Atterbury had promised that they would back the plan or at least not oppose it was attributed to a Senator who has been acting as one of the go-betweens for the President.

It was also stated at the White House that the government is always anxious to bring about a settlement in matters of this kind which vitally affect the public welfare and that there was very great disappointment that the proposal submitted was not accepted all around. However the President was represented as feeling that a great advantage had been gained in that both the railroad executives and the union leaders have accepted what he terms the two basic points in the settlement proposal, namely, that both managers and workmen agreed to recognize the validity of all decisions of the Labor Board, that the carriers would withdraw lawsuits and that Labor Board decisions which have been involved in the strike may be taken to the Labor Board for rehearing. This recognition of the authority of the Labor Board is regarded by the President as the most important point and he feels that so long as both parties accept the jurisdiction of the Labor Board a marked degree of progress has been made. As to the third point of the proposal, relating to seniority rights, it was stated on behalf of the President that the government only undertook voluntary mediation because that sort of mediation between carriers and employees is contemplated in the Transportation Act.

Brotherhoods Urge Acceptance of President's Original Proposal

The legislative agents of the engineers', firemen's and trainmen's brotherhoods called on President Harding on Saturday, August 5, to present the views of their executives in connection with the shop strike situation and their complaints that their members had been urged to take out equipment in unsafe condition. A telegram to the legislative agents sent by W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers; W. G. Lee, president of the Brotherhood of Railroad Trainmen, and D. B. Robertson, president of the Brotherhood of Locomotive Firemen and Enginemen, had asked them to present the following to the President:

"Complaints in increasing numbers are pouring into our respective offices against demands that our men take out locomotives and equipment which are in dangerous and unsafe condition, in violation of safety statutes and rules which have been enacted for the protection of the lives and property of the public, and of assaults on and insults to our members by armed guards that are placed on the various railroad properties.

"Up to this time, by constant urging of a neutral attitude, fidelity to their contracts and in the interest of public peace and safety, we have prevailed on our members to continue at their posts. Constant aggravation of the above conditions and the refusal of the railroad executives to accept the proposals of the President for a compromise settlement of pending questions are making the situation infinitely more difficult to handle. The plain intention of the railroad executives to smash the shop craft unions is resulting in more and more of the locomotives and equipment getting into disrepair, and the dangers of a most hazardous occupation are being daily increased.

"We fear that a continuation of these conditions will inevitably result in our members, as a matter of self-protection, being drawn into the controversy, and we greatly deplore such a contingency.

"We feel that the American public is fully in sympathy with the President's efforts to settle this strike, and, in the light of the above facts and in the interest of public welfare, peace and safety, we suggest you call upon the President and urge him to again bring this matter to the attention of the railroad executives, with the hope that he may yet succeed in convincing them of the necessity for their prompt acceptance of the President's proposals, which have been accepted by the shop crafts.

"Continued refusal to accept the President's proposals for a compromise settlement of pending questions will place upon the railroad executives full responsibility for the increasing seriousness of the situation.

"We suggest you file this message with the President, as a basis for discussion with him of the questions at issue and to show you have full authority of the undersigned chief executives to meet him. We are wiring the President you will call upon him with full authority to discuss this subject."

The brotherhood representatives told the newspaper men that they had no thought of a sympathetic strike but that they were trying to emphasize the seriousness of the situation.

I. C. C. to Report on Locomotive Inspection

The Senate on August 7 adopted without debate the resolution proposed by Senator King of Utah directing the Interstate Commerce Commission to report whether the locomotive inspection act is being violated and, if so, the extent of such violation, and whether inspection of locomotive boilers is presently being made in all federal locomotive boiler inspection districts and on all roads, as required by the act. The commission is preparing to reply to the resolution as quickly as possible. It will probably reply that its force of inspectors is totally inadequate to report on the condition at any given time of 70,000 locomotives scattered over 270,000 miles of track and 4,000 terminals, but it is doubtless in a position to give the results of the reports that have been made by its inspectors.

According to reports reaching the commission, there have

been comparatively few cases of enginemen refusing to take out locomotives because of their condition and they have received instructions from their officers to ignore minor defects but to take it up with the management if they feel that the engine is actually unsafe. Labor leaders said on Tuesday, however, that new instructions had been issued.

Mr. Gompers on Record

As a part of the campaign to alarm the public, Samuel Gompers, president of the American Federation of Labor, on August 8, issued the following statement:

"Reports of railroad wrecks have been frequent of late and in at least one such accident, on the Missouri Pacific, 35 persons were killed and more than 100 injured.

"There has been no statement as to the cause of these frequent wrecks other than the statements issued by railroad managers which have uniformly ascribed the wrecks to causes other than faulty railroad equipment. In the most serious of these recent wrecks the railroad officials stated that the engineer had run past stop signals.

"In view of the large number of apparently authentic statements charging a deplorable condition of railroad equipment, the public should be furnished with a more authoritative and unbiased statement than any which are furnished by railroad officials where train accidents occur.

"If it is true that a high percentage of locomotives is unfit for operation may it not be the case that the increasing frequency of railroad wrecks is due to the use of such defective locomotives?

"It seems to me entirely proper that in every case of a railroad accident there should be an immediate inquiry by public officials who are not under the influence of railroad authorities and that the public should be immediately informed of the results of such inquiry in order that it may be known whether use of unfit locomotives, in defiance of rules of safety and in defiance of law, is taking a toll of human life.

"Constant reiteration, by persons evidently in possession of accurate information, of charges that totally unfit locomotives are being used both in the freight and passenger service of the various railroads justifies the demand for some other explanation for the increasing number of wrecks than those offered by railroad officials."

The Bad Order Locomotive Situation

The Association of Railway Executives on August 4 authorized the following:

"Representatives of the striking railroad employees are attempting to arouse public concern over the alleged enormous impairment in the condition of the motive power and cars of the railroads.

"No industry in the world is conducted with anything like the publicity which surrounds all the important aspects of American railroad operation. Among other things the railroads report and publish regularly statistics covering their car loadings, their idle cars and their bad order equipment.

"The stories to the effect that a thousand locomotives are falling out of use every day are ridiculous. On July 15 of this year—two weeks after the strike began—there were fewer locomotives in bad order than February 1, March 1, April 1, May 1 or June 1. Below are the figures showing the number of bad order locomotives from July 1, 1921 to July 15, 1922, inclusive:

	Locomotives
July 1, 1921	15,437
August 1, 1921	15,643
September 1, 1921	15,569
October 1, 1921	15,471
November 1, 1921	15,491
December 1, 1921	15,790
January 1, 1922	15,383
February, 1922	15,865
March 1, 1922	16,297
April 1, 1922	16,165
May 1, 1922	16,227
June 1, 1922	15,765
July 1, 1922	14,424
July 15, 1922	15,764

"The number of bad order cars has been excessive ever since the period of federal control. The inability of the railroads to earn even operating expenses during a part of 1921, coupled with the resistance of the men now on strike to any reasonable reduction in wages, made the adequate maintenance of the cars of the country financially impossible over a long period. Bad order cars on July 1 numbered 324,583, and on July 15, 342,078, an increase of 17,495. This is not an abnormal increase, in view of the traffic indicated by the heavy car loadings of the months of June and July."

Of the 15,764 locomotives in bad order on July 15, 12,254 needed repairs requiring over 24 hours and 3,510 required less than 24 hours.

In a conference with newspaper men on Tuesday Mr. Jewell and Mr. Johnston said they had been trying to get information regarding the condition of equipment but had not yet analyzed their reports. However, they said, experience indicated that the railroads ought to repair 70,000 cars a day, including 6,000 for heavy repairs and 64,000 for light repairs, and about 1,000 locomotives a day, and with the men on strike these repairs are not being made while accurate reports are not being made because only a few inspectors are left in service. Mr. Johnston said that even if the strike were settled at once it would take a year to get the equipment back into proper condition.

Mr. Johnston also volunteered the information that they had received reports from pickets that railroads had imported strikebreakers from Europe, in ignorance of the character of the work, and that they had taken the matter up with the Department of Labor. He said he had not the faintest idea as to how many had been so imported and he mentioned the Chesapeake & Ohio as the source of his "first report" on the subject.

Asked whether the men would go back to work in the event the government should take over certain roads on the basis of the President's proposal Mr. Johnston said: "If the government took over all the roads," and Mr. Jewell assented, "is this government going to constitute itself a strikebreaking agency by taking over the roads on which we make the strike most effective?" he asked. There will be no separate settlements, they added. The labor leaders also asserted that Mr. Cuyler had not only seen a written copy of the President's original plan but that he had promised to accept it and that the President was "put out" because the labor leaders insisted that they were without authority to accept a plan.

Predictions That President May Take Over Coal Roads

Press predictions that the President is thinking of taking over the railroads or those on which coal movement has been retarded since the beginning of the strike of shop employees are apparently based on rather vague statements of one or two cabinet officers that the government has the power, if it were deemed necessary, to have receiverships declared for roads which are unable to give proper service, but there have been no indications in official circles that such a plan has been very seriously considered. It has been definitely stated at the White House that the President believes he has power in case of a sufficient emergency to take over either the railroads or the coal mines without legal legislation, but it was added that it was not likely that the railroad situation would take that tack. There has been a suggestion, however, that the President would propose legislation for the creation of a coal commission and there are some more or less definite plans for amendments to the labor provisions of the transportation act.

Southern Railway's Proposals Rejected

The committee representing the shop crafts on the Southern Railway on Tuesday definitely rejected the proposals of the company for an individual settlement on the basis of the President's original proposal, on the ground that a national issue is involved and that any settlement must be made on a national basis.

Declaring that the Southern Railway had "more than fulfilled" its duty to striking shop employees in endeavoring to get them to return to work under the terms of President Harding's strike settlement offers, Fairfax Harrison, president of the road, sent telegraphic appeals throughout the service for assistance in the endeavor to maintain "unimpaired transportation service" notwithstanding the strike.

"Our duty is to our employees, the public and the company," the message said. "The duty to our striking employees we have more than fulfilled, and I now call upon you, whatever is your occupation, to assist the management in performing its duty also to the public and the company. This obligation calls for unimpaired transportation service and this we will perform."

Strikers' Meeting Postponed

The meeting of the officers of the shop crafts intended to be held on Wednesday to consider the President's proposal was postponed until Thursday, but it was stated that no definite answer to the President would be formulated at least until after the general conference of the 17 railroad labor organization executives on Friday.

T. H. Davis, chairman of a general shop crafts committee of the Pennsylvania System, headed a delegation of Pennsylvania employees who called on President Harding on Wednesday and urged the President not to countenance any strike settlement which would impair the seniority status of men who remained in railroad service in spite of the strike. About 65 per cent of the Pennsylvania shop employees, Mr. Davis said, remained at work and others who went out have returned, so that at present about 75 per cent of the old men are on the job.

Mr. Jewell issued a statement on Wednesday based on the figures in the American Railway Association's semi-monthly report of locomotive equipment filed for July 15, which, he said, showed that the railroads had fallen behind in required locomotive repairs during the first 15 days of the strike by 6,587 locomotives. He also called attention to the fact that the report itself shows that the figures of previous reports were used "account labor trouble" for 18 roads. The statement also said that the federal locomotive inspection and safety appliance laws are not being complied with during the strike; that no proper inspections are being made and no reports being released giving the true condition. Mr. Jewell said there are only 50 government inspectors and asked why additional government officials are not assigned to require compliance with the law and protect the traveling public and railroad employees when taxpayers are called upon to pay for "thousands of additional guards, police and sheriffs, to say nothing about state militiamen and federal soldiers."

Secretary Hoover on August 7 issued the following statement in reply to reports that at a conference with a number of New York bankers on August 1, preceding his address to the railway executives, he had tried to persuade the bankers to use their influence toward a settlement of the strike: "The statement as it appears in the press is entirely incorrect. The meeting took place between myself and a small group of bankers and others at the request of some of their members, in which the general economic situation that was resulting from the coal and railway strikes was discussed by me, and I counseled that all responsible men should show moderation.

"There was no suggestion that banking pressure should be brought on any particular group, but that men of influence should exert themselves toward securing compromise and early settlement."

Strike Developments in Chicago and the West

IN THE WEST during the past week the strike of shopmen has been a story of continued success on the part of the railroads in rebuilding their shop forces, accompanied by intermittent outbreaks of rioting and violence which has resulted in the death of strikers, loyal employees and police officers who have attempted to restore order. To a large extent the past week's developments are a repetition of those described for the previous week in the *Railway Age* of August 5, page 249. The resumption of violence on the part of the striking shopmen was not wholly unexpected inasmuch as the railroads emphatic stand on the seniority issue, their announced intention of protecting to the fullest extent their loyal employees and those who have been hired to take the place of strikers, and the success of the carriers in recruiting new and experienced men, have all tended to make the strikers restless and apprehensive as to the success of the strike and their future. On the other hand, the constantly recurring rumors of a settlement by the government, always with the intimation that the strikers will be restored with their seniority and other rights practically unimpaired has tended to retard the return of shopmen to work.

The success western roads are meeting in rebuilding their shop forces is clearly indicated by the fact that whereas on July 25, 44,501 shopmen were at work, on August 1, the forces had been increased to 58,073, on August 3 to 63,329 and on August 5 to 65,552.

Practically all of the larger roads in the west are reporting daily increases in their shop forces of from 150 to 300 men, all experienced and capable workers who have been selected with the view of their becoming permanent and useful employees. Some of the large roads in Chicago have been so successful in the recruiting of employees that their shop forces are rapidly approaching normal and this has resulted in several cases in an actual improvement in the bad order car situation as compared with the situation prevailing before the strike began.

The propaganda to the effect that the strike is seriously interfering with freight and passenger traffic in western territory has led to the issuance of several statements by the western executives giving the results of daily reports, particularly by those roads whose headquarters are in Chicago. On August 4 it was said:

"The reports of the roads (with headquarters in Chicago) show that the strike is having practically no effect upon the ability of the carriers to render adequate freight and passenger service, all of the roads reporting that they are handling freight traffic currently and that the operation of passenger trains continues normal."

On August 8, it was announced that:

"The western roads report that they are handling the freight traffic offered in a normal way. Several of the larger roads report that they are handling an exceptionally heavy freight traffic, almost equal, in several cases, to the heaviest movement on record. As to the passenger traffic, reports of the curtailment of service, when correct, apply practically without exception to unprofitable and unnecessary trains which have been taken off solely to conserve coal supplies."

Rioting and Intimidation Continues at Various Points

The violence which has accompanied the success of the carriers in building up their shop forces and followed their decided stand on the seniority issue has been most marked at Joliet, Ill., where on August 7 a serious riot necessitated the calling of state militia to restore order. A special agent of the Elgin, Joliet & Eastern and a striker were killed and Sheriff James A. Newkirk was seriously wounded in the fighting. According to the latest reports the state troops have restored order.

At Joliet, as has been the case at many other points during the past two weeks, violence has been due not to attempts on the part of strikers to interfere with railroad operations but to their attempt to intimidate loyal employees in and around their homes. In the majority of cases strikers have gathered, marched to the homes of loyal employees with the intention of damaging their houses and property as much as possible and bloodshed has resulted when police officers have attempted to disperse the rioters.

The tense situation prevailing after the rioting at Joliet

and the arrival of state troops resulted on August 9 in the refusal to work by the train service employees on the Joliet division of the Elgin, Joliet & Eastern. The walkout was called in protest against the presence of the troops in the terminal yards at Joliet and was decided upon at a meeting of the brotherhood men involved on August 8. The train service men felt that the troops were not needed in Joliet, according to the chairman of the local organization. The engineers, firemen, conductors and brakemen reported for work as usual on August 9 but refused to take out their trains and engines until the troops had been removed.

Among the other acts of violence which have been reported during the past week are the following:

One man said to be a striker was killed and another wounded during an exchange of shots on August 3 at Van Buren, Ark., between guards in the Missouri Pacific shop and men who are believed to be strikers or strike sympathizers. At Jackson, Mich., several police officers and striking shopmen were injured, when more than a thousand strikers and sympathizers, including many women and children, attacked non-union workers as they were leaving the shops of the Michigan Central at that place. Eighty strike sympathizers attacked more than sixty workers in the Chicago Great Western shops at Des Moines, Iowa, resulting in the severe injury of one participant and the kidnapping of several of the loyal employees. All of the men kidnapped were later accounted for, having been carried some distance and mistreated before being released. On the same day two demonstrations before the homes of loyal employees were made in Lincoln, Neb., by strikers and sympathizers. Four non-union employees of the Missouri, Kansas & Texas were severely treated and put off a train at Upton, Texas, by strike sympathizers.

On August 4 two deaths resulting from rioting were reported, one in Edgemond, S. D., where a switchman of the Chicago, Burlington & Quincy was shot and the other in Chicago where a carpenter employed in the Illinois Central shops was beaten to death. A repairman in the Illinois Central shops at Chicago was also severely beaten because he refused to join the strikers. A Union Pacific trainmaster was seized by a mob at Las Vegas, Nev., taken several miles into the desert and given a coat of tar and excelsior by a crowd of strike sympathizers. Previous to this four women had attacked the wife of a Union Pacific roundhouse foreman as she was carrying dinner to her husband and severely beat her. At Birmingham, Ala., two men and two women were severely injured in a clash between non-union workers and striking shopmen of the St. Louis-San Francisco.

On August 5 the reports from various parts of western territory included the following:

At Newark, Ohio, a negro claiming to be a federal marshal shot and killed a striking shopman and wounded another. At Albert Lea, Minn., several men were seriously injured and a large number suffered minor injuries in an attack on the Minneapolis & St. Louis roundhouse by strikers and strike sympathizers. According to the report approximately eighty men stormed the roundhouse, driving the employees therein away but again losing control of the property when the employees launched a counter attack and retook the building. At Joliet, Ill., a striking shopman formerly employed by the Elgin, Joliet & Eastern was shot while doing picket duty near the property of that carrier. Striking shopmen blamed the armed guards in the employ of the railroad for the shooting and it resulted in tense ill feeling which later culminated in the disturbance described above. On August 6, a car foreman employed by the Illinois Central at Birmingham, Ala., was kidnapped and severely beaten by armed men supposed to be striking shopmen.

More Carriers Obtain More Injunctions

More injunctions restraining strikers or strike sympathizers from interfering with the work of loyal employees and new men hired to take the place of those on strike were issued during the past week to various western carriers. Among the injunctions of this character reported during the past week are included those involving the Chicago, Milwaukee & St. Paul at Madison, Wis., Helena, Mont., and Seattle, Wash., the Texas & New Orleans and the Gulf, Colorado & Santa Fe at Texarkana, Texas, the Nashville, Chattanooga & St. Louis at Chattanooga, Tenn., the Chicago & North Western at Superior, Wis., and the Los Angeles & Salt Lake at Salt Lake City, Utah. At several points strikers or their sympathizers have been arrested under the provisions of similar injunctions, for instance, 17 men being arrested at Beardstown, Ill., and Roadhouse, charged with violating injunctions previously issued to the Chicago, Burlington & Quincy and the Chicago & Alton. The men were released on bond and will be tried in the Federal Court at Springfield, Ill.

Rumors of the Spread of the Strike Again Circulated

Reports of a spread of the shopmen's strike are still being circulated, many of the leaders of other organizations announcing, as strategic moves, that their membership continue to urge the calling of a strike in sympathy with the shopmen or on new "grievances."

E. F. Grable, president of the United Brotherhood of the Maintenance of Way employees, on August 6 received a telegram from William D. Roberts of Wilkes-Barre, Pa., vice-president of the maintenance of way organization on 28 eastern railroads, asking for a sympathetic strike in behalf of the shopmen. Mr. Grable is quoted as having notified Mr. Roberts that "there would be no change in our program for the present." Somewhat similar situations have been reported from time to time by the leaders of the other organizations which had previously decided to abide by the Board's decisions and allow the shopmen to carry on their fight alone. Reports of difficulties of a similar character on individual roads in western territory have also been made during the past week, among them the threat of the strike of clerks on the Great Northern, strike balloting on seven other northwestern roads by the same class of employees, the threat of the strike of maintenance of way employees on the Chicago Milwaukee & St. Paul and a similar move by the telegraphers on the Big Four.

That the strike situation now centers in Washington is indicated by the fact that not only has B. M. Jewell, president of the Railway Employees Department of the American Federation of Labor and head of the striking shopmen, and his executive counsel directed their activities from there during the past week, but that Mr. Grable, J. G. Larson, head of the train dispatchers' organization, E. H. Fitzgerald, president of the clerks' union and several other leaders have either joined the Washington gathering or announced their intention to do so in the future.

Santa Fe Shopmen Petition President Harding and Labor Board for Protection

The loyal and new shop employees of the Atchison, Topeka & Santa Fe on August 2 urged both President Harding and Ben W. Hooper, chairman of the Labor Board, to guarantee them their positions and seniority when the shopmen's strike ends. The telegram, in the form of a resolution, outlines the events which led up to the strike, adding:

"Whereas, the members and officers of the several crafts have openly threatened to run out of the various shops all men now employed therein including foremen, when they (the crafts) return to work, and,

"Whereas, these threats linked with the press reports of peace being near have been the means of keeping the minds of the men in fear and uncertainty, thus keeping many men from returning to work and,

"Whereas, we have reasons to believe that this is the only motive that actuates the strike leaders in putting out this 'peace defensive' as they call it,

"Resolved, by the men employed in the shops of the Santa Fe railway that having confidence in the promise of the Labor Board, backed by the President of the United States and believing them incapable of permitting any organized board to deprive men who have been loyal to the government in this great crisis, of the right of employment retained or accepted under certain solemn promises as were made to the men now working on American railroads,

"Therefore be it further resolved, that a failure on the part of our government to redeem the promises made would be a betrayal of the men who remained loyal because of the belief so frequently expressed by government representatives that the crafts were striking against a decision of a government board and would destroy all faith in government."

Labor Board Agrees to Take Up Seniority Issue

The Railroad Labor Board, acting upon the President's new plan for settlement of the strike, adopted a resolution on August 7 agreeing to take up the seniority issue and render a decision on it. The Board's resolution said:

Whereas, the President of the United States recently made certain suggestions to the railway executives and the representatives of the railway employees now on strike, looking toward the settlement of the strike, which suggestions were in part agreed to by both parties, and

Whereas, the one question upon which there was such a wide divergence of opinion that the carriers declined to accept the President's suggestion was that of the reinstatement of the men on strike with seniority and other rights unimpaired, and

Whereas, the President has since suggested that the question of seniority be submitted to the Railroad Labor Board for hearing and decision, and

Whereas, the Railroad Labor Board on July 3, 1922, passed a resolution which, while it makes no express reference to seniority has been generally construed to have inferential bearing on same, and

Whereas, it has been thought that this resolution, although it does not possess the force and effect of a decision, might stand in the way of the submission of this question to the Railroad Labor Board in accordance with the suggestion of the President, now, therefore,

Be it Resolved, that the Board signify its willingness to extend to the carriers and any employees concerned ample opportunity to present in accordance with the Transportation Act and the established procedure of the Board any dispute involving the seniority question or to seek an interpretation of the rules covering said question, and to submit, on both sides, such testimony and argument, as may be deemed advisable; to the end that the Board may, after a full and fair hearing of every phase of the question involved, render a formal decision adjudicating the matters in controversy. It is the purpose of the Board to indicate by this resolution that it will as promptly and readily consider and determine the questions of seniority growing out of the present strike as it will rehear the wage and rule questions which were originally involved in the strike. The only difference in the attitude of the Board toward the wage and rule questions on the one hand and the seniority question on the other, is that as to the former, the Board would be called upon to rehear matters already formally decided and, as to the latter, to consider a question which has not been formally heard and decided, but which has been inferentially touched upon in the resolution of July 3, 1922.

An amendment to this resolution was offered by A. O. Wharton, the only member of the labor group on the Board present, to the effect that the "Board rescind the resolution of July 3, insofar as that resolution has been interpreted to affect the question of seniority." This amendment, however, was defeated and Chairman Hooper subsequently made the following explanation of his vote which also explains the position of the majority on this question:

"I voted NO on the proposed amendment because it in effect requires the Board to take action now on the question of seniority, which is the very thing that this resolution proposes that the Board shall do later, after a full hearing has been had. A resolution without this amendment means that the Board is in a position to give the question of seniority full and fair consideration regardless of the resolution of July 3."

W. L. McMenimen and Albert Phillips, the other labor members on the Board, and R. M. Barton, a member of the public group, were not present. The resolution was passed by the votes of Chairman Hooper and G. W. W. Hanger, both of the public group, and the three members of the railroad group, Mr. Wharton voting against.

Labor Board Chairman Approves President's Peace Plan

Commenting on President Harding's new peace proposals, Chairman Hooper on August 8 said:

"The President's proposition is fair and practical. It would conserve the law, would sacrifice the rights of neither party and would save the country from the further ill-effects of the strike.

"It was to be anticipated that there would be some objection to it on both sides, but such objections are not insuperable. The concurrent condemnation of opposite extremes raises a suspicion that the President must have found the safe and sane position of fairness and conservatism. The opinion already expressed by one executive that the President's recommendation seems to 'demand a complete surrender' on the part of the railways and the characterization of the proposal by a leader of the employees as 'an uncalled for attempt to help the railroads break the strike' will be hard to reconcile in the public mind.

"On many of the railroads, the President's plan can be carried out without any inconvenience whatever, on others with but slight inconvenience, and, on a small number, it would unquestionably involve some difficulty.

"It must not be overlooked, however, that there are several conditions that would contribute to the working out of such a solution. Many of the new men employed by the carriers in the haste and urgency of a strike are not competent mechanics, and will ultimately be dropped for cause. On a large number of the roads, there was not a full shop force before the strike began, many men having been laid off for months. It is estimated that 75,000 men had thus been furloughed. The rising tide of business prosperity and the consequent increase of railway traffic, coupled with the accumulated shop work resulting from the strike, will necessitate the employment of a greatly enlarged number of mechanics. The other ordinary processes of readjustment that always follow a strike would likewise operate effectively. On a very large number of the roads, in my judgment, the question of seniority would never even arise."

The Situation in the East

STRIKE CONDITIONS on the Eastern roads have, generally speaking, undergone but slight change during the past week. No serious disturbances have been reported. Traffic moves normally. The roads by continued recruiting are bringing their shop forces to higher and higher percentages of normal. Indeed so favorable have conditions become on some of the roads that they are assisting roads in other sections of the country by sending men to them. The roads which have been aided in this manner are the Chesapeake & Ohio, the Norfolk & Western, the Louisville & Nashville and the Virginian—all of which serve non-union bituminous coal regions and on which the unions have concentrated their efforts to bring about a stoppage of traffic. The New York, New Haven & Hartford has been acting as an employing agent for the Norfolk & Western and Chesapeake & Ohio and has placed advertisements in papers in its territory stating that New Haven officers will accept applications for positions on these roads.

Official figures of shop forces in Eastern territory, as of August 4, given out by L. F. Loree, president of the Delaware & Hudson, were 103,528 or 64.7 per cent of normal, as against 97,724 or 62.7 per cent on July 28. The Pennsylvania has been particularly fortunate in increasing its shop forces. On August 4 its forces totaled 46,603, or 77.5 per cent of normal. A progress report on recruiting given out by this company is given in the accompanying table.

There have been some few instances of narrowly averted accidents suggestive of attempted sabotage, the most outstanding of which occurred last Sunday on the Long Island, when a number of current-carrying third rails were taken from

tracks in the electrified zone, apparently in a malicious attempt to wreck trains and bring a stoppage of heavy Sunday traffic to the beaches. The railroad has offered a reward of $1,000 for the arrest and conviction of persons found guilty of the deed, and it is reported that strikers in the metropolitan area have offered a similar reward.

A strike of clerks on the New York, New Haven & Hartford which was threatened last week has been averted by an agreement between the management and these employees which is said to restore temporarily the working conditions which prevailed prior to July 1, but under the new rates of pay as established by the Labor Board.

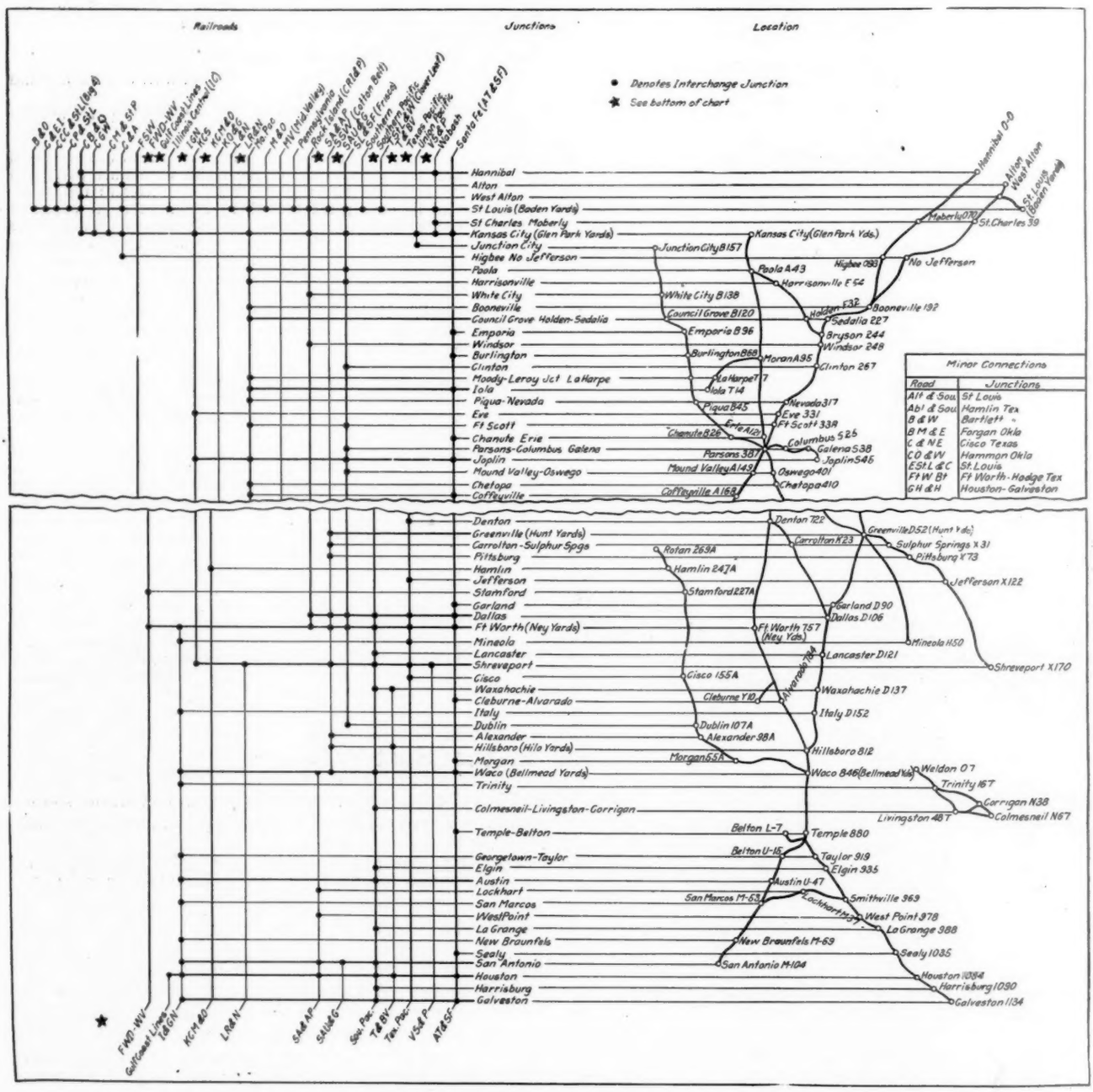
A Comparative Statement of Men Working—Pennsylvania System Shop Forces

Date	Normal	No. working	Per cent working	Increase over same day of previous week	Increase over July 5th
July 8th	60,157	40,875	67.9	2,590	2,590
July 15th	60,157	41,885	69.6	1,010	3,600
July 22nd	60,157	42,368	70.4	483	4,083
July 29th	60,157	44,448	73.9	2,080	6,163
Aug. 4th	60,157	46,603	77.5	2,155	8,318

Employees of the Cooke plant of the American Locomotive Company at Paterson, N. J., to the number of approximately 250, walked out on Tuesday rather than permit repairs to be made to Erie locomotives. It was said that these strikers have appealed to employees of other plants of the American Locomotive Company likewise to refuse to repair locomotives of railroads whose shop employees were on strike.

The Erie has announced the cancellation of 20 trains in the Hornell region on account of the shortage of fuel.

The Pennsylvania announced on Wednesday of this week that striking employees returning to the service would not lose their accumulated pension privileges. Seniority, the statement said, depends upon the continuity of employment, while pensions are based upon the total years of service, regardless of whether they are continuous or not.



A Conveniently Arranged Chart of Interchange Connections—Missouri, Kansas & Texas Lines

A Convenient Chart of Interchange Connection

A CHART showing all interchange connections of the Missouri, Kansas & Texas system, arranged alphabetically by the names of the roads and by locations on the home line, has been developed by R. W. Edwards, superintendent car service of the M. K. & T. lines. The chart, the form of which is shown in the illustration, is contained in the latest circular of information and instructions governing employees in the disposition of empty railroad owned freight equipment, and has been so proportioned that it occupies the two middle pages of the 8-in. by 11-in. circular.

By referring to the illustration on the opposite page it will be seen that the names of the connecting lines are listed across the top. With one exception this list has been arranged alphabetically so that any road may be quickly located. In the case of the Santa Fe, however, the fact that numerous interchanges with this road are located along the entire line led to its location at the right of the list of connections, adjoining the table of junction points, merely as a matter of convenience in the organization of the chart.

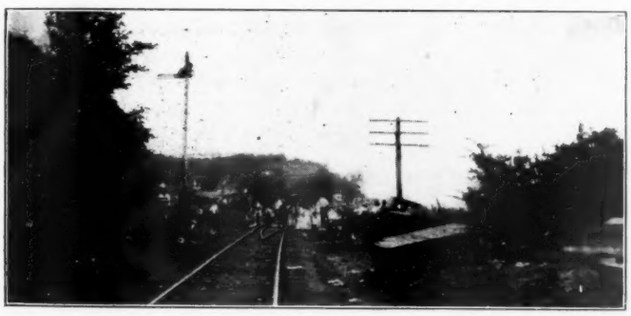
The table of junctions is arranged vertically in station order from north to south, the map of the line being distorted sufficiently to permit joining each name in the table with the corresponding location on the road by a horizontal line. These horizontal lines are continued to the left, intersecting the vertical lines extending downward from the names of the connecting roads, the names of the connections at each junction point being indicated by black circles where the horizontal and vertical lines intersect. In addition to the table of junction points the names of the junctions are shown on the map together with their station numbers, which indicate the mileage from the northern terminals in the case of main line points and the mileage from the junctions in the case of branch line points. To simplify the appearance of the chart those roads with connections nearer the southern end of the system have been star marked in the list of connections at the top of the chart and repeated at the bottom with the vertical reference lines extending up from the bottom.

The purpose of this chart is to facilitate the reduction of empty mileage in the disposition of empty foreign freight cars. It is intended for use in station and yard offices, where the nearest interchange point with any connection may quickly be located, the mileage being readily computed on the basis of station numbers. The circular containing the chart will also be distributed to carload shippers along the line of Missouri, Kansas & Texas, to whom it will prove useful in routing interline shipments.

Missouri Pacific Accident at Sulphur Springs, Mo.

Rear-End Collision on Evening of August 5, Results in Death of 37 and Injury to Over 100 People.

ONE OF THE WORST accidents in the history of the Missouri Pacific occurred at Sulphur Springs, Mo., on the evening of August 5, when passenger train No. 4, northbound from Texas, crashed into the rear of local passenger train No. 32, killing 37 and injuring over 100 people. Train No. 32 had stopped for water when train No. 4, having passed a distant and a home automatic block signal set against it, crashed into it. The engineman of No. 4 jumped off and was killed; and the fireman was severely injured.



Home Signal Location 232-233—Signal 232 Was Knocked Down

The collision occurred on the Missouri division of the Iron Mountain, 23 miles south of St. Louis. This line is double track from St. Louis to Cliff Cave, a distance of 13 miles and is single track from that point south. Trains are operated by train orders and an automatic block signal system which extends from St. Louis to Poplar Bluff, Mo., a distance of 165 miles. The track follows the west bank of the Mississippi River from Cliff Cave through Sulphur Springs to Riverside, 3.5 miles south of Sulphur Springs and is a succession of curves with only short stretches of tangent.

Approaching the point of accident from the south, northbound distant signal No. D232 is located 1,275 ft. north of mile post 24. The track is tangent to a point 396 ft. north of the signal where it curves to the left with a 2 deg. curve 1,320 ft. long. There is then 198 ft. of tangent when a 2 deg. 48 min. curve starts to the right. The accident occurred at a point 1,360 ft. from the beginning of this curve. The water tank is located on the curve 615 ft. north of the point of the accident and the Sulphur Springs station is 422 ft. north of the tank. A bridge about 85 ft. long and about 50 ft. above water spans Glaize creek. The south end of the bridge is 495 ft. south of the tank.

The single track territory where this accident occurred is protected by automatic block signals. Three position upper quadrant home signals are used and two position upper quadrant distant signals, the latter operating from the 45 deg. position to the 90 deg. position. Home automatic block signals Nos. 232 and 233 are located 35 ft. south of the south end of the bridge. The northbound distant signal 232, mentioned above, is 3,289 ft. south of its home signal. The

Looking South from Point of Collision

control circuits of both the home signal and its distant signal overlap the next home signal in advance, the control of northbound home signal 262 at Riverside, extending beyond the next northbound home signal 232, at which point the accident occurred.

The first point at which the engineman on train No. 4 could see the water tank is 3,337 ft. south of it. The tank and standing train should also have been visible 3,112 ft. south; and the home signal, tank and all of train 32 should have been visible to the engineman on train No. 4 at a point 2,254 ft. south. A full view of the rear of the standing train could be obtained at a point 709 ft. south of the home signal location. There is 1,089 ft. of tangent track approaching distant signal D232. When train 32 stopped with the engine opposite the water tank, the end of the rear car stood approximately 80 ft. south of the home signals south of the bridge.

Train No. 32 had 10 cars, including two baggage cars, one combination baggage and mail car, one mail car, three chair cars and three coaches. Train No. 4 had a mountain type passenger locomotive and consisted of 12 steel cars including 6 baggage cars, two combination coach and chair cars, one Pullman, two dead-head coaches and a dining car.

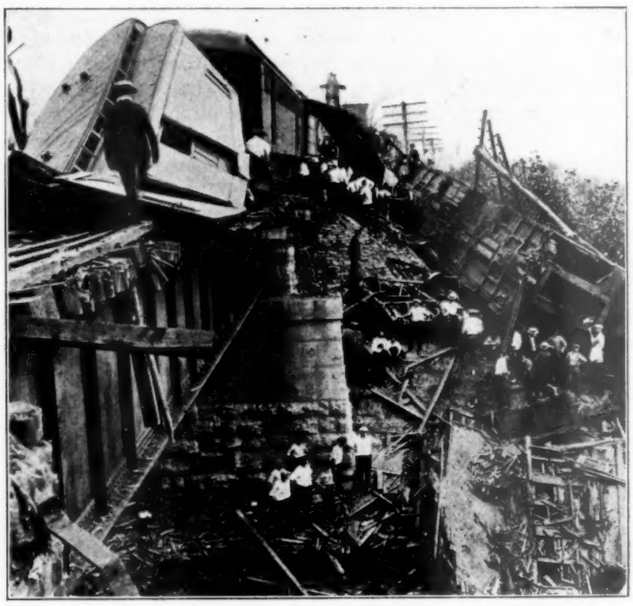
On the evening of the accident, No. 32 arrived at Riverside at 6:48 and departed at 7:07, while No. 4 passed at 7:13. No trouble had been experienced by either train in making running time although No. 32 was 2 hrs and 11 min. late out of Riverside and No. 4 was 20 minutes late. No. 32 was delayed at Riverside longer than usual as it had an order to meet No. 41. No. 4 had been running about 45 miles an hour and slowed down to about 25 miles an hour at Riverside to pick up a 19 order which read:

"No. 1 engine 5,306 wait at White House until 7:37 p. m. Wicks 7:40 p. m. for No. 4 engine 5,312."

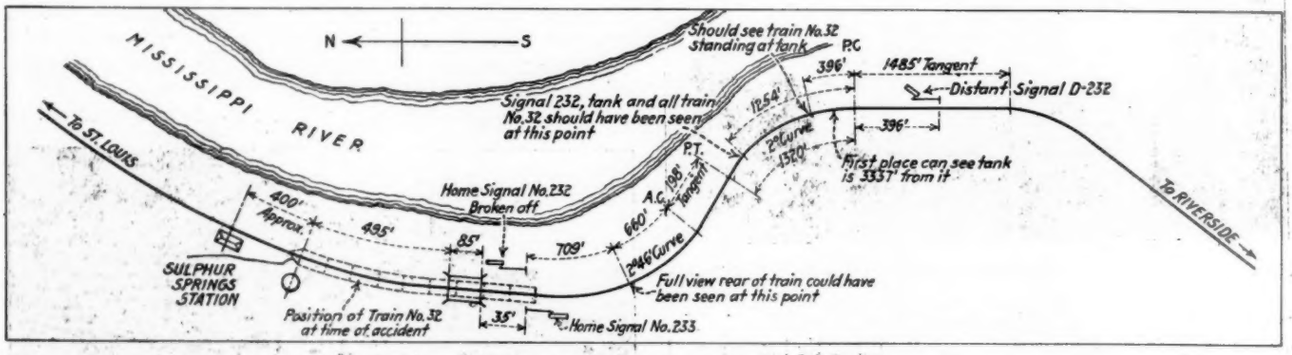
No. 4 then began to pick up speed and apparently passed home automatic block signal No. 262, located about 1,380 ft around the curve north of Riverside station. This signal was in the stop position. No. 4 evidently failed to reduce speed at distant signal D232 governing the approach to home signal 232, the point of the accident. The speed of the train was estimated to be about 40 miles an hour when it struck No. 32, although just before the crash brakes were applied in emergency. No. 32 had stopped at the water tank about 30 seconds before the crash came, the fireman not having started to take water. The flagman was on the fourth car from the rear and north of the bridge.

Members of the train crews stated that the automatic signals gave the proper indication after they had passed them. They were found to be indicating properly by signalmen after the accident and all lights were burning. The mast of signal 232 was knocked down but the mechanism was found in the stop position.

The coroner's jury at the inquest held at De Soto on August 7 returned a verdict that the collision was due to the negligence of the engineman of train No. 4 in failing to observe signals. In the investigation by the Bureau of Safety representatives which began immediately after the close of the coroner's inquest members of the train crew on No. 4 stated that at the ten or twelve stops made before the accident they observed nothing unusual and that the engineman had no trouble in making the customary station stops. The fireman was too badly injured to obtain a statement at that time. The engineman had been in the service of the company for 37 years and had a perfect record. The investigation showed that the crew of train No. 32 had been lax in flagging at Riverside and Sulphur Springs. Both trains involved were of the same class and had equal rights. When No. 32 was at Riverside the conductor inquired of the operator if he should let No. 4 pass between there and St. Louis. The dispatcher, when told that No. 32 expected to let No. 1 pass at Wicks, 4.2 miles north of Sulphur Springs, said he could let No. 4 pass there. The employees involved were not on duty in violation of the hours of service law.

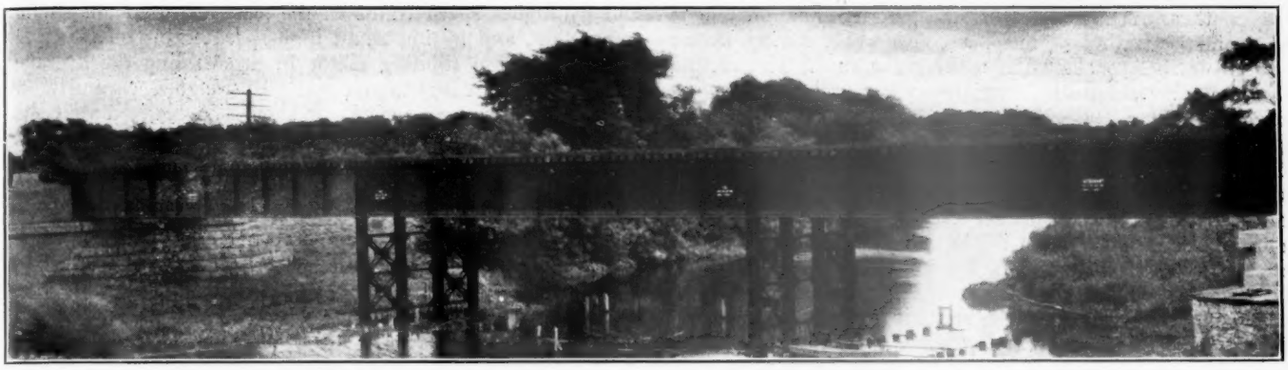


A Close-Up of the Wreckage



Layout of Track and Signals at Scene of Accident

THE COMMISSION has granted the motion of the Corporation Commission of Oklahoma to dismiss the proceeding involving Oklahoma intrastate rates because of the removal of the unlawful discrimination against interstate commerce which had resulted from previous action of the Oklahoma commission.



The Application of Engineering in Transportation*

Modern Operation Requires Analytical Study of Data and Formulation of Practices Therefrom

By G. D. Brooke,
Superintendent of Transportation, Western Lines, Baltimore & Ohio

WHAT IS THE TEST or criterion of an engineer? Is it the degree conferred by an institution of learning? Without any thought of disparaging the value of such a degree and with full recognition and belief in the advantages of the training of technical men in our colleges and universities, the answer is, "No!" What, then, is the measure of an engineer? The national engineering societies require as qualifications of membership from six to ten years' actual practice and some four or more years in responsible charge of work—graduation from a school of engineering of recognized standing being equal to two years of actual practice—and moreover, the ability to design engineering works. Experience then is the requisite of the engineer; and knowledge and ability gained through this experience, as evidenced by having been in actual charge of work, of having directed such work and of being competent in engineering design, are the things which measure the engineer.

The officers of our railroads, the trainmasters, superintendents, general superintendents, superintendents of transportation, general managers, and others, whatever their titles may be, who have direct charge of transportation, through their years of service or practice in transportation, through their knowledge and ability gained in the school of experience, as evidenced by the organizations, the operations, the work under their direction, have qualified as transportation engineers just as truly as have our engineers of construction, our mechanical engineers and our maintenance engineers qualified in their respective branches of engineering. And our usefulness as transportation engineers is measured by the skill with which we carry through our undertakings, by our ability to do well with one dollar that which can easily be done with two after a fashion, by our capability to comprehend and bring about the proper balance between locomotive maintenance, locomotive operation, and other transportation expenses.

Moreover, the methods of engineering are generally applicable in dealing with transportation problems. They consist briefly of surveys, observations or other means of collecting data, the marshalling of this data by means of drawings, tabulations or other convenient form, the study and analysis of the information thus prepared, the designing of structures or works or the planning of methods of procedure, and the actual construction in accordance with the designs or the execution of the work according to the plans. In some of the problems of engineering the conditions are to a large degree fixed or constant and can be met with designs or plans of work which are to a certain degree permanent. In others the conditions are gradually changing and have to be met by changes in design. In no branch of engineering is there such continual changing of the conditions as in railroad transportation. Not only is it subjected to varying physical conditions, as by the seasonal changes of temperature and other weather conditions—by which also the maintenance of roadbed and tracks are affected—but the flow of traffic is subjected to the same seasonal changes and in addition many other influences are constantly being brought to play upon it. This inherent characteristic of transportation, variability, places upon the transportation engineer the task not only of thorough study and analysis of the problems arising from the more constant conditions but also of meeting continually in an effectual and economical way new situations which, although they present themselves almost daily and without warning, are persistently different from their predecessors.

Careful Analysis Will Bear Fruit

In some classes of service the requirements of the traffic fix to a large degree the general features of the schedules, the size of the trains and the character of the equipment. This is particularly the case in passenger service and the opportunities for economies are not so great as in other branches. But even here continued and careful analysis will bear fruit. On a division where there are a number of local passenger runs it may be found feasible, by changing the lay-up points of engines and cars or by coupling up runs to reduce the number of locomotives and cars required, and even to reduce the crew expense. And as passenger travel varies with the seasons and from other causes, it will frequently be found that cars can be taken off during light periods and so save locomotive fuel and repairs to equipment and insure greater reliability in the observance of the schedules. Where a passenger train has a fast schedule, particu-

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larly if there are a number of stops, the elimination of one car from the train will make a considerable saving in the amount of fuel consumed in making the runs. The cutting off from a six-car train of one heavy car will easily save a ton of fuel on a 100-mile run over the average profile.

An important feature of transportation is the adaptation of train operation to the requirements of the traffic. The problems to be met vary from the simple one of a slow moving traffic, as of coal or ore on some engine district reaching into the mine fields, where the business can best be handled in slow freight trains, with perhaps one or two local passenger trains per day, to the busy multiple track trunk line with a heavy and diversified traffic, requiring two or three classes of passenger trains with varying schedules, express and mail trains, two or more fast freight trains, a large volume of slow freight to be moved in tonnage trains, and the local and pickup trains which handle the way freight, do the station switching and move cars to and from local points.

Each case between and including these extremes offers a different problem. A simple one is that of an engine district having a mixed freight traffic requiring some two to three through freight trains, a local freight train, and two local passenger trains per day in each direction. It will probably be found that the best freight service can be given by running at least two freight trains daily on definite schedules, suitably spaced throughout the 24 hours, and handling any additional business in extras, run daily or every other day as required. The freight trains may be heavily loaded and the schedules slow but if they are maintained with regularity the service will be reliable and satisfactory from a traffic standpoint as well as economical and efficient in the use of locomotives and cars. Branch line trains of this kind should be scheduled to arrive at the junctions so that cars of important freight can be switched out and forwarded without excessive delay in fast freights on the main line, thus affording continuous movement to destination. With a more complex traffic situation a more elaborate arrangement of train service must be provided. The important thing is to plan the train service so as to be attractive to travelers and shippers and thereby enable the traffic department to sell transportation, to fill the empty seats and to give the freight locomotive a full load.

Large Train Loads

In recent years the value of a high train load has become to a great extent a matter of course, and many railroads have systematic methods of following this important feature of transportation. It is not possible to emphasize too strongly the important relation of the train load to the cost of moving freight. Fortunately methods of determining the proper tonnage ratings for locomotives have been established scientifically and are available in the proceedings of the American Railway Engineering Association and in other engineering and railroad literature, so that it is a comparatively simple matter to compute the train load for various speeds on the ruling grades and the adjustment factors to compensate for the frictional resistance of additional cars under varying temperatures. There remains, though, the ever-present problem of determining, under varying traffic conditions, the running time over the engine district with given speeds on the ruling grades and of ascertaining thereby the engine rating which will produce ton-miles at the minimum cost.

On a district having a small percentage of the mileage of the ruling grade, particularly if broken up into short sections, the locomotives can be rated for quite slow speeds on the ruling grade—say from seven to ten miles per hour—without seriously lengthening the time over the district. On the other hand, where much of the mileage is of the maximum grade the rating must be made for higher speeds on this grade in order that the time over the district will not be excessive. Of course, the amount of interference by opposing trains and by higher speed trains in the same direction on single track lines, and by important high speed trains on multiple track lines, is a limiting factor in determining the average speed over the district, and must be weighed carefully in fixing the locomotive rating. It should be realized that the economical rating of a few months ago when traffic was very thin may not be the economical rating today with the more frequent business, nor that of today the proper rating for next fall when the volume of traffic will be heavy.

On a mountain division which moves a heavy traffic, some two-thirds of which is coal, it has been found economical to reduce the tonnage of the eastbound trains by one-third during periods of light business and to use one pusher on the helper grades instead of the two required for the heavier train load. This makes practicable the closing of two helper stations and speeds up the road movement so that overtime is virtually eliminated, resulting in a lower cost of handling the freight. When business is heavy, though, it has been found that with a given number of locomotives available a greater volume of tonnage can be moved with the heavier trains, requiring two helpers on the hills, and it has been found expedient to revert to this scheme of operation even though the cost is somewhat higher.

Through Routing of Trains

Another feature of great importance in transportation is a definite scheme of systematic switching or classification and through routing of trains. Although offering possibilities of great economies, it has not received anything like the attention during the last decade that has been accorded the development of the train load, due doubtless to the results being of a less definite nature and more difficult to reduce to figures, and to the failure of transportation men to realize fully the advantages which follow the establishment of such a scheme. Then, too, a great deal of careful and painstaking work is required and when the plan or scheme has been developed there is need of a firm hand to supervise it and to see that there are no departures from its provisions.

Detailed information as to the routing of business over and the delivery and assembling of loads and empties on each road and terminal district, the amount and character of classification already in effect at each yard, the capacity of each yard both for holding cars and for switching, the character of the traffic and the train schedules, must be gathered and prepared in tabulations, diagrams or other convenient form for analysis. And since the officer who is to work out or design the scheme should have a working knowledge of each yard and each engine district, it seems essential that he supervise and personally engage in the assembling of this information. Then, with suitable plans of the yards and terminals and track charts of all engine districts, he is in position to analyze the problem thoroughly and to draw up a tentative scheme of classification to meet both the divisional and the system requirements. After this it is advisable to call together in conference the yardmasters and the superintendents and other transportation officers in suitable groups to consider the tentative scheme and make such revisions as may be found advisable.

The completed scheme should then be published in suitable form for distribution to the officers and employees whose duty it is to carry out its provisions. The cardinal principle of systematic classification and through routing of trains is that the first classification yard that switches a car after the bill is made and it starts on its journey, places it in the classification that will take it through to the point of delivery, or to the last yard short of its destination, without another switch. Station order switching of cars for the engine districts leading out of each yard, the classification of empty cars according to their class and suitability for loading with the different kinds of freight are among its provisions.

To obtain the full benefit of the through routing of trains

it is advisable also to establish a scheme of car inspection and repairs by which the equipment will be in condition when loaded or when received in interchange to go through in the proper classification without being cut out for repairs. Then, with a sufficient volume of business, trains can be built up to move through terminal after terminal as "main trackers," requiring only the changing of locomotives and crews and such inspection as is necessary to detect unsafe defects which may have developed on line of road since leaving the last terminal.

Intensive Utilization of Cars

The economic or intensive utilization of freight cars embraces the principal factors of high average car mileage and high average car loading, which are to a considerable degree inter-dependent. There must be not only a high mileage per car per day but the unproductive mileage must also be reduced to the minimum. By unproductive mileage is meant the useless haul of cars, whether loaded or empty. When two or four or ten cars are used to move a shipment of freight where one or three or nine would have sufficed, unproductive mileage is made just as truly as where there is a cross-haul of empty cars suitable for the same class of loading. It is here that the feature of proper car loading comes in. By far the greatest percentage of empty mileage is not unproductive mileage, for the reason that in the nature of the traffic there is no possibility of securing a return load and the movement of the empty is an integral step in transporting the shipment. With the proper realization of this condition an analysis will show that the opportunities of reducing unproductive mileage are far less than seem to be generally assumed.

It would seem then that about the only way to make unproductive empty mileage is to haul empty stock cars, refrigerators or box cars east or north or to move empty coal cars away from the mining districts. And such really is the case. It is true that during the war, and the years of heavy business succeeding it, the movement of traffic was more nearly balanced and stock cars, gondolas and even flats were loaded with cement, stock cars with brick and tile, rough loading box with tinplate and other finished steel products, to quite a large extent. In fact a load could be secured for almost any car capable of being made approximately suitable even at a heavy expense. This condition reached the maximum in March, 1920, when the railroads of the country were able to reduce the empty mileage to 27.7 per cent of the total —the lowest of which there is record. But these were not normal times nor does there seem to be much likelihood of a recurrence of the balance of traffic movement which then obtained.

There are a few instances of cross-haul of box cars, rough loaders being used in one direction and good tight cars in the other, causing duplicate empty mileage, but these are exceptions. During the periods when business is falling off rapidly, considerable empty mileage is made in hauling cars to suitable points for storage. Empty mileage is also made in the movement of bad order cars to convenient shops for repairs. None of this empty mileage, moreover, is unproductive mileage, for it is made in meeting situations which arise in the most practicable way.

How, then, is unproductive mileage made? Largely through the inexperience or carelessness of agents, yard clerks and other employees who route the cars improperly. During the extensive relocation of equipment which took place in the autumn of 1920 and the following winter, there was doubtless considerable of this misrouting, for the car service rules had been inoperative for several years, during which many new employees had entered railroad service and the personnel of the yard and station forces was untrained or rusty in the handling of cars under the rules. A year later when another relocation of the same kind but of a less extent took place, and these forces were well trained, there was comparatively little of this misrouting of empty cars. There is even greater improvement in this respect at the present time and although if all of the unproductive movements on a large railroad system could be stated in car mileage, the figures probably would be rather startling; if reduced to a percentage of the total car mileage, the result would seem insignificant and the efficiency of car handling would be found quite high.

The attainment of a high average car mileage requires sufficient business to utilize all suitable cars, freedom from congestion in road movement, prompt handling in yards and at stations and quick loading and unloading by the shippers or the railroad's own forces. The attainment of a high average carload requires the securing of as many loads as possible in the direction of the preponderating empty movement, the distribution of the cars so as to adapt the size and capacity of the car to the character of the load, co-operation of shippers in loading the cars to either the cubic or the carrying capacity and the obtaining of such maximum loading at freight stations, warehouses and other loading points operated by the railroad.

Lengthening Locomotive Runs

If the accounts of a railroad are examined it will be found that the expenses directly affected by locomotive utilization and train operation will run around 35 per cent of all expenses and 50 per cent of the cost of maintenance of equipment and conducting transportation. From this it is apparent that a broad field is offered here for effecting real economies. A great many factors are involved, some of which are the adaptation of types of locomotives to the requirements of the service, the length of locomotive runs, the pooling of locomotives or their operation with regular or assigned crews, the manipulation of power by the chief dispatcher, and the scheduling of slow freight trains out of terminals and over the road.

Here, as in other branches of transportation work, there are many situations to be met and each requires thorough analysis to determine what is the best solution. On one division pooling will give the best results; on another the regular crewing of locomotives will be found best. The tendency of the immediate present seems to be towards longer locomotive runs in both freight and passenger service. Long runs keep the locomotives on the road and so increase the percentage of working time to the total, and reduce the number of dispatchments and hence the engine house expenses. The mileage per locomotive is increased so that the same work is done by a smaller number of locomotives and in this way the cost of locomotive maintenance is decreased. In passenger service coal burning locomotives have for years been making runs of 200 to 300 miles and locomotives in slow freight service 150 to 170 miles regularly and even as high as 187 miles on a very heavy traffic division. So there is nothing new or experimental in long runs. But a very large percentage of the freight runs have been around 100 miles, ranging perhaps from 80 to 120 miles. Now modern locomotives are capable of long periods of sustained performance and the number of comparatively short runs seems to offer excellent opportunities of coupling up runs and effecting economies thereby. A number of passenger locomotive runs have recently been lengthened on the Baltimore & Ohio, the longest resulting run being from Louisville to Toledo, a distance of 330 miles, and on one division the freight locomotives are now running 258 miles where the runs were formerly one-half that distance.

In adapting locomotives to the service on various districts the problem is usually that of using those on hand to the best advantage. The elimination of light types from heavy service and of retiring them permanently or at least so long as heavier locomotives are available is of prime importance;

almost equally so is the disposition of the occasional type which is unusually vulnerable and is constantly giving trouble on the road or spends too much of its time undergoing repairs. Then, too, it may be found that a certain type of locomotive will perform more efficiently and reliably in continuous service, or its weight and axle loads will meet possible restrictions, and hence is peculiarly fitted for use in connection with the lengthening of runs.

On every engine district having a heavy mixed traffic slow freight trains called during certain periods of the day will make better runs than those called at other hours. The chief dispatcher will be found taking cognizance of this and arranging the calls of slow freights accordingly. The full development of this idea will prove of much value where a large volume of slow freight is to be moved in extra trains and can be carried a step further by making standard schedules for the movement of the trains over the district. They can be prepared in simple form, for example, giving the running time between points where operating stops are made, as at water stations, coal docks, and helper stations, and can be printed on cards of convenient size to be carried in the pocket or in the back of the time table. These schedules set the pace for the engine and train crews and give them something definite to work to in their trips over the district.

Substantial results have recently been obtained by the establishment of schedules for the operation of freight trains with assigned locomotives and crews on the Chicago division of the Baltimore & Ohio. An analysis of the traffic on the division showed an unbalanced movement, the eastbound power requirements being the greater on account of the volume of livestock and quick dispatch freight moving in light high speed trains. The westbound slow freight was being handled in trains of full tonnage and the surplus power run light. The division consists of two districts of approximately 150 miles each and the men in engine and train service live principally at the intermediate terminal, Garrett, Ind. It was determined to give trains to all westbound locomotives and runs were scheduled so as to get the power to Chicago in time to return with the eastbound movement of livestock and quick dispatch freight trains departing between 6 p. m. and midnight.

A brief description of one schedule will make clear the method of operation: a train departs from Willard at 3 p. m. and arrives at Garrett at 11 p. m., where it changes engine and train crews; it then departs at 11:30 p. m. with the same locomotive and train and arrives at South Chicago at 7:30 a. m. On the return trip the train departs from South Chicago at 7 p. m. and arrives at Garrett at 11:30 p. m., where it changes engine and train crews, the men relieved having 24 hours ahead of them off duty; the train departs at 12:01 a. m. and arrives at Willard at 6 a. m. The engine and train crews leave Willard on the schedule at 3 p. m. and arrive at Garrett at 11 p. m., where the men are relieved and are off duty for 24 hours. The schedule requires two locomotives, four engine crews and four train crews. The men are on duty about 16 hours on the round trip and have an eight hour rest at South Chicago or Willard and 24 hours off duty at Garrett, out of each 48 hours.

The advantages are improved working conditions for the crews; running locomotives through and thereby increasing the mileage and eliminating the roundhouse work at Garrett, elimination of all overtime, the better movement of westbound loads and empties, the saving of approximately 150 car days per day, and the general toning up of the entire organization and performance of the division. Although this method of operation was not started until March 10, the mileage made by ten locomotives used in the service averaged 5,763 miles for the month, the highest made by any one locomotive being 7,032 miles. This average is about 2,000 miles greater than a similar average for the month of February. The results are considered thoroughly satisfactory.

The Toledo division of the same road has recently furnished a good example of the unusual demands frequently met in transportation. The coal production in eastern and southeastern Kentucky has been very heavy since the middle of April and a large part of the business has been routed through Cincinnati. The Baltimore & Ohio, having docks at Toledo, has received the routing of all the coal for transshipment via the lakes and also a heavy all-rail traffic. The division consists of a double track line from Cincinnati to Dayton—60 miles—and a single track line from Dayton to Toledo—140 miles—there being only two short stretches of double track north of Dayton. The heaviest previous business was handled in July, 1918, when 736 loads and 29 empties per day were moved north from Cincinnati. During the first 15 days of May an average of 931 loads and 44 empties has been moved, an increase over the previous record business of 27 per cent. The southbound daily movement into Cincinnati during the same period was 233 loads and 705 empties, a total of 938 cars.

The movement of this heavy traffic in a very satisfactory manner has been due to the ability to dispose of the all-rail business to connections freely; the control of the lake coal by temporary restrictions when the dumping at the lake port was retarded on account of weather conditions or shortage of boats, a sufficient but not an over-supply of suitable power and the systematic classification and through routing of trains on this and connecting divisions. There are three through and one local passenger trains per day in each direction over the single track north of Dayton and two scheduled fast freights and one local freight. From 17 to 21 trains per day have been required to move the freight tonnage north from Cincinnati.

THE ILLINOIS CENTRAL, in its latest newspaper advertisement to promote better relations with the public, tabulates the history of its "1921 Dollar" as follows:

WHERE THE 1921 DOLLAR CAME FROM

	Cents
Transportation of freight (44,637,466 tons; average distance per ton 270.46 miles; average revenue per ton per mile 1.015 cents)	71.71
Transportation of passengers (37,027,889 passengers; average distance per passenger, 25.25 miles; average revenue per passenger per mile 3.104 cents	16.98
Transportation of mail	1.69
Transportation of express	1.53
Sources related to freight service, such as demurrage and storage, and special service	0.49
Switching service	0.85
Sources related to passenger service, such as operation of parlor cars, excess baggage, etc.	0.56
Hotel, restaurant, dining and buffet service	0.58
Station and train privileges, and miscellaneous	0.32
Rents of equipment, road, buildings and other property, joint facilities, and miscellaneous income	2.79
Income from corporate investments	2.50
	100.00

WHERE THE 1921 DOLLAR WENT

	Wages Cents	Material Cents	Total Cents
Maintenance of tracks, roadbed, buildings, bridges and other structures (wages, 54.7 per cent; material, 45.3 per cent)	8.56	7.09	15.65
Maintenance of locomotives, freight and passenger cars and other equipment (wages, 62.67 per cent; material, 37.33 per cent)	11.87	7.07	18.94
Train, station and switching operations, and other transportation service (wages, 92.96 per cent; material, 7.04 per cent)	24.81	1.88	26.69
Traffic agencies, compilation and issuance of tariffs, miscellaneous traffic expenses (wages, 73.44 per cent; material, 26.56 per cent)	0.94	0.34	1.28
Hotel, restaurant, dining and buffet service (wages, 48.39 per cent; material, 51.61 per cent)	0.30	0.32	0.62
Fuel	...	...	7.50
Salaries of clerks and other general office employees	...	...	1.48
Legal expenses	...	...	0.18
Pension department expenses	...	...	0.16
Salaries of general officers	...	...	0.19
Valuation expenses	...	...	0.15
Miscellaneous general expenses	...	...	0.37
Depreciation and retirement of equipment	...	...	3.90
Loss, damage and casualties	...	...	1.97
Rent of equipment, leased lines, joint facilities and miscellaneous rents	...	...	2.45
Interest on bonds and other interest charges	...	...	6.85
Dividends on capital stock	...	...	4.48
Taxes	...	...	5.54
Balance available for enlarging and improving the property	...	...	1.60
			100.00

James M. Herbert

JAMES M. HERBERT, president of the St. Louis Southwestern and its subsidiary, the St. Louis Southwestern of Texas, died suddenly in St. Louis on August 5 from an attack of apoplexy. He was stricken while in his automobile returning from a baseball game and died before he could be removed from the car.

Mr. Herbert was a man of great energy, both physically and mentally. He was essentially a man of action, aggressive in disposition, with the ability to make decisions quickly. When he came to the Cotton Belt as vice-president on August 1, 1916, the situation required a strong hand. The property was under-maintained and the equipment was in particularly bad condition. Mr. Herbert attacked this problem with a directness that brought a marked change within a short time.

Being promoted to president on August 1, 1917, he was in charge of the property during the turbulent days of federal control which began five months later and during the equally trying period of reconstruction which has followed. These days were particularly turbulent among the roads of the Southwest where the existing order was changed more radically than elsewhere.

J. M. Herbert

Mr. Herbert was known among those with whom he came in contact as a man who possessed the courage of his convictions. An interesting illustration of this characteristic of his was afforded by his decision to reject the government guarantee of earnings during the six months' period following the termination of federal control. Standing on his belief that the property had suffered under federal administration, he chose to undertake its rehabilitation without that support and the restrictions which would have followed. That this decision required courage is indicated by the fact that during the calendar year 1919 the road had failed to earn its standard return by $2,348,755. That Mr. Herbert's confidence in the ability of the management to regain its ground was well founded is indicated by the fact that the net income of the road for this guarantee period exceeded the standard return which the road would have received by $306,754, after spending $1,593,285 more for the maintenance of the property than it was estimated that the road would have been permitted to have spent under the terms of the guaranty.

Mr. Herbert was a man who was willing to assume responsibility and who, as president, directed the management of the property in detail. Having started at the bottom in the operating department he had a thorough grasp of the problems which enabled him to establish a close contact with employees. The Cotton Belt, in common with other roads, suffered from the demoralization of its forces during federal control but with the return of the property to its owners on March 1, 1920, Mr. Herbert was successful to an unusual degree in enlisting their co-operation. As a result, during the switchmen's strike in the spring of 1920, the Cotton Belt was able to keep its freight house in St. Louis open continuously and had the situation so well in hand that it offered to send to connecting roads for freight if these roads were themselves unable to make delivery. This aggressive policy has also done much to win the support of the shippers for the road.

Mr. Herbert was born at Belmont, Pa., on January 15, 1863. He entered railroad service in 1880 as a night telegraph operator on the Wabash, St. Louis & Pacific, now a part of the Wabash System, after which he was employed consecutively on this road as station agent, yard clerk, train dispatcher, chief train dispatcher and train master to June, 1897, with the exception of a few months when he was with the Cleveland, Cincinnati, Chicago & St. Louis. From June, 1897, to June, 1898, he was train master on the Eastern division of the Grand Trunk with headquarters at Island Pond, Vt. He was then train master at Belleville, Ont., for two months and in July, 1898, he was promoted to superintendent of the Eastern division, which position he held until October 1, 1900, when he was appointed superintendent of the Colorado and Pacific divisions of the Missouri Pacific with headquarters at Osawatomie, Kans. On April 1, 1901, he was promoted to general superintendent of the St. Louis, Iron Mountain & Southern and in July of the same year he was appointed manager of the Pacific System of the Southern Pacific. From November 1, 1901, to January 1, 1903, he was general manager of the Denver & Rio Grande and the Rio Grande Western. From the latter date to December 7, 1905, he was vice-president and general manager of the Colorado & Southern and from that time to March 1, 1906, was first vice president of the same road. From March 1, 1906 to July 1, 1914, Mr. Herbert was out of railway service. On July 1, 1914, he was elected president of the Colorado, Wyoming & Eastern. On August 1, 1916, he became connected with the Cotton Belt as first vice-president, and, as stated above, was elected president one year later.

HALF A MILLION DOLLARS A DAY is the loss, as estimated by an officer of the Forest Products Laboratory, which American shippers of freight sustain by reason of the use of improper or inadequate containers for their goods, and by poor packing. Col. B. W. Dunn, chief inspector of the Bureau of Explosives, quoting this statement, says that he is extending his activities into the field of non-explosive shipments; and he would like to have shippers keep adequate records of all goods sent out, by means of which, after experience, and advice from consignees, they would discover the defects in their containers, if there be any; and the collating of such shippers' records from many places will make possible an intelligent study which would lead to the making of any improvements found desirable in the design of containers of all sorts.

Atlantic Coast Line Reports Favorable Earnings

Net Railway Operating Income for Year 1921 Was $6,860,107. For the First Half of 1922 It Is $8,845,354

THE ATLANTIC COAST LINE reports for the first six months of 1922 a net railway operating income of $8,845,354. This is more than twice the 1921 first six-months' figure which was $3,170,358. The property's standard return for operation during federal control was $10,180,915. The question now is as to whether the peak figure which was reached in 1917, namely $13,239,902, will be equaled this year.

Atlantic Coast Line traffic is fairly even throughout the year although as a rule its traffic is somewhat heavier in the spring months. The comparative evenness of traffic results from the road's serving a territory extending north and south and from the large volume of perishable freight. The road is, in fact, said to be the largest originator of perishable freight in the country. Traffic in this territory is ready for market in relation to the season. The cycle begins in November and from that month until about May the citrous fruits and fresh vegetables move from Florida. As the season advances growing areas further north begin to supply traffic.

Increased Business in 1922

In the first six months of 1922, the gross was $37,095,580 as compared with $36,732,035 in the first six months of 1921. This increase was due to increased traffic. Our latest figures are those for the five months ending May 31. In the first five months of 1922 the Atlantic Coast Line reported net ton-miles (including revenue and non-revenue) totaling 1,493,188,000 as compared with 1,443,661,000 in the first five months of 1921. Car loadings figures are available up to the third week of July. They show that traffic in July is not running quite as heavy as it did in preceding months. It continues, however, to be well ahead of last year at the same time.

It was noted above that the Atlantic Coast Line's standard return was set at $10,180,915. In 1918 it earned $11,155,520 or 5.44 per cent on its property investment. The net in 1919 was $6,539,900 or 3.07 per cent. In 1920 net after rentals was $1,380,569 or but 0.62 per cent. In 1921, exclusive of guaranty period lap-overs, the figure reported was $6,860,107 which is 2.90 per cent on the investment. These figures are interesting as a basis of comparison for 1922's figure of $8,845,354 for the six-months' period.

23.92 Per Cent Less Tons in 1921 Than in 1920

In 1921, as compared with 1920, the Atlantic Coast Line moved 23.92 per cent less tons and 24.65 per cent less ton-miles. The revenue tons carried totaled 13,180,144 as compared with 17,324,916 in 1920. The principal reductions were in products of mines, products of forests and manufactures. Products of agriculture, making up 17.11 per cent of the total tonnage, supplied 2,255,275 tons as against 2,339,316 tons in 1920. Because of the importance of products of agriculture in Atlantic Coast Line tonnage it is worth noting that tobacco made up 1.05 per cent of the total 1921 tonnage; cotton, 1.50 per cent, and fruit and vegetables, 7.17 per cent. Products of forests supplied 3,764,980 tons or 28.57 per cent of the total, this figure comparing with 4,507,861 in 1920; lumber at present is moving much better than it was moving at this time a year ago. The road originates no coal; in 1921 it carried 931,575 tons or 7.07 per cent of its total tonnage.

One of the factors in Atlantic Coast Line traffic in 1921 was the low prices, this being a factor on this road as on most Southern roads in that the amount of tonnage southbound depends so greatly upon the buying power which the products of the territory yield. Concerning this matter the Atlantic Coast Line 1921 annual report said: "The low prices received for all agricultural products have had a depressing influence upon the industry as a whole. The boll weevil depredation in South Carolina, Georgia and in some countries of North Carolina, in its effect upon the cotton crop, has been one of the chief factors in this depression." The Atlantic Coast Line in 1921 carried 54,804 tons of live stock. The encroachment of the boll weevil has led the road to give some attention to the possibilities of live stock traffic. It is rather interesting, therefore, to read in the annual report: "On account of the recent advance in the price of live stock, especially of hogs, we may reasonably expect an increase in the number of hogs raised for market. As a hog producing state, Georgia is exceeded only by Iowa."

Reduction of 15.93 Per Cent in Operating Expenses

Freight revenues in 1921 totaled $44,556,741 as compared with $48,193,387 in 1920, a reduction of $3,636,645 or 7.55 per cent. Total revenues were $66,730,768. This compared with $74,121,956 in 1920, the reduction being $7,391,188 or 9.97 per cent. The operating expenses were decreased $10,988,029 or 15.93 per cent. The 1921 figure was $58,005,833; that for 1920, $68,993,862. The operating ratio in 1921 was 91.53, which, while high, was considerably below the 1920 figure of 97.43. At present the road is operating at less than 70. The net operating revenues in 1921 totaled $5,649,935, a sizable improvement indeed when compared with the 1920 net of $1,903,094. All of the foregoing figures are exclusive of federal control period lap-overs.

With further reference to the 15.93 per cent reduction in operating expenses, the reduction in maintenance of way expenses was 19.88 per cent; in maintenance of equipment. 10.52 per cent, and in transportation, 18.32 per cent. The reduction in maintenance of way expenses is of special interest because this reduction in dollars was accompanied by a greatly increased amount of work as designated in material units. For instance, there was laid in existing tracks 208 miles of new 85-lb. rail, whereas in 1920 the figure was only 122 miles. Including relay rail, in 1921, 273 miles, or about 5.9 per cent of the total main line and branch mileage, was given new steel. The number of ties placed in existing tracks in 1921 was 1,679,820 as compared with 1,634,425 in 1920. These figures include practically no treated ties. Ballasting in 1921 totaled 449,991 cu. yd., nearly all gravel, this figure comparing with 269,977 cu. yd. in 1920. Tie plates were used to the number of 1,686,427 in 1921; in 1920, the figure was 1,306,112.

The annual report showed also considerable improvement in other directions, notably with reference to shops and shop equipment. The report gives rather an imposing detailed list of the improvements of this kind. The net charges to additions and betterments of all kinds in 1921 were $7,763,607 which compared with only $2,098,722 in 1920. Additions and betterments to equipment in 1921 totaled $6,545,325.

Corporate Net in 1921 Totaled $1,790,569

The Atlantic Coast Line in 1921 had a net corporate income after fixed charges of $1,790,569. This compared with $7,684,156 in 1920 when the road had the advantage of

standard return for two months and guaranty for six. In 1919 when its earnings from railroad operations were represented in the standard return the corporate net was $7,187,537. The company derives "other income" running from $4,000,000 to $5,000,000 annually. In 1921, the other income was $4,423,110; in 1920, it was $5,203,804. This other income is mostly dividend income—which in 1921 was $2,890,384—but there is also a large return in the form of income from funded and unfunded securities, etc. A large share of the dividend income is represented in the 367,200 shares of Louisville & Nashville of which the Atlantic Coast Line owns a majority interest. The L. & N. is now proposing a 73 per cent stock dividend, the majority portion of which will accrue to the Atlantic Coast Line. This is, naturally, one of the leading factors of interest insofar as concerns future earnings of the latter property, particularly as it is expected that the L. & N. will be able to maintain a good dividend rate even with the increased stock.

The Atlantic Coast Line fixed charges in 1921 totaled $8,212,826. The dividends are at the rate of 5 per cent on the $196,700 preferred and 7 per cent on the $68,586,200 common and total $4,810,869 annually. These are paid from profit and loss account. The company's profit and loss credit balance on December 31, 1921, was $48,704,648. The general impression one gets of Atlantic Coast Line affairs is that at present the property is in rather a favorable position, the two chief elements of which are its favorable net earnings from railroad operations in recent months and the benefit which is expected to accrue from the L. & N.'s proposed stock dividend.

Virginian Realizes on Non-Union Coal Traffic

Has Net After Rentals of $3,833,222 for 1922 First Six-Months as Compared with $4,726,886 for Whole Year 1921

COAL LOADINGS in the Pocohontas district for the week ended July 29 totaled 16,721 cars, the lowest reported for that district so far this year. This information is rather disconcerting because the Pocohontas district, the three roads in which serve largely non-union mines, has been geting out about one-third of our coal supply since the beginning of the strike. The reason for the present decline is primarily the shopmen's strike combined with which the Chesapeake & Ohio and the Norfolk & Western have had a clerk's strike of no mean proportions. Loadings in the Pocohontas region in June ran about 31,000 weekly. They reached a peak of 31,460 for the week ended June 24. The following week they were 31,331 and then they fell to 22,945 for the week ended July 8 to 19,037 for the week ended July 22 and now to 16,721 for the week ended July 29.

These figures may be regarded from two angles. The first is the fact that the country is having difficulty in keeping up its half-normal coal supply. The second point is the effect on the net earnings of the three roads in the Pocohontas district—namely the Chesapeake & Ohio, the Norfolk & Western and the Virginian. The first point is beyond question important enough. It is the second question, however, that will receive our attention in the present article, and particularly with reference to the third of these three carriers —the Virginian. The effect on net earnings will, of course, be adverse. But there happens to be a silver lining in the cloud, namely that as low as the July loadings have been they are still ahead of the loadings a year ago. There is the additional important detail that the Pocahontas district lines have been able to realize handsomely on the heavy loadings of the months preceding July. The June loadings which averaged some 30,000 cars weekly compared with loadings in the same weeks of last year of but about 24,000. Loadings in the first half of 1921—up to May at least—were not very good. For several weeks they ran only about 13,000 to 17,000. This indicates that the July condition, as severe as it may finally prove to be, can be regarded as only a temporary setback which is balanced by a long period of very excellent business.

July Loadings Off But Still Ahead of 1921

So much for the situation in its larger aspect; now as to the status of the individual road to which it is proposed to direct our interest—the Virginian. This road reported for the first six months of 1922 a gross income of $10,485,199 which compared with a gross in the first six months of 1921 of $9,596,649. For the first half of 1922 it had an operating ratio of 57.93 as contrasted with a figure for the first six months of last year of 65.03. To June 30, 1922, the net railway operating income was $3,833,222 which is a rather sizeable improvement over the figure for January to June last year of $2,917,300. In July the Virginian had a falling off in traffic similar to that of its two neighbor roads. Its coal loadings in July were 9,184 cars as compared with 12,752 cars in June. But the July loadings—strike or no strike—were still good; they compared with 9,110 in July last year. The seriousness of the situation is still further minimized by the fact that in July, 1921, there was a falling off also; June, 1921, loadings were 12,544 cars. Much seems to have been made by the strikers' publicity men as to the difficulties at the Hampton Roads coal piers. The Virginian apparently has been affected to a minimum degree. Its coal dumpings at its Sewells Point pier for July, 1922, totaled 8,366 cars or 468,159 tons. In July, 1921, dumpings were 5,802 cars or 334,828 tons.

Virginian operations are characterized by the high proportion of coal tonnage—over 90 per cent of the total tonnage is coal; and by the manner in which this coal moves in heavy trainloads to tide-water. This combination and an unusually high traffic density enable the road to realize on a plant characterized by its high engineering standards. Further than that the road has been improving its position year by year and is becoming an increasingly important factor in the Hampton Roads situation.

The improvement in the road's position is indicated in that the property had a standard return of $3,247,603. This it did not earn for the government in 1918 or 1919, in which years the net railway operating income was $1,952,872 and $2,555,230 respectively. In 1920, however, the road earned a net railway operating income of $4,776,886 and in 1921 with a sharp reduction in tonnage the figure was held to $4,726,940. We have spoken of the 1922 results to date; that they bid fair to exceed 1921 seems fairly certain.

Average Train Load 1812 Tons

In 1921 the road carried 6,376,648 revenue tons of freight of which 5,691,790 tons was coal. In 1920 the revenue tonnage was 7,784,517. The 1921 revenue ton-miles totaled 2,308,049,877 and the revenue ton-miles per mile of road were 4,387,177. In 1920 the traffic density figure was 1,440,384 which is high enough for the main line of many a busy road of two or more tracks. Of course, in the Virginian's

case it is due to coal moving in heavy trains and heavily loaded cars. The average train load in 1921 was 1,812 which was increased from 1,718 tons in 1920 even with the reduced traffic. Virginian cars include many of 120-tons capacity. The average carload in 1921 was 55.55 tons, comparing with 51.10 in 1920. The road secures an average haul on its freight of 362 miles and in 1921 its revenue per ton per mile was 0.679 cents.

The road's gross revenues in 1921 totaled $18,024,357 of which $13,743,395 was for coal and coke. In 1920 the road had a gross of $18,158,853. This shows for 1921 a decrease of but $134,496 which is explained, in view of the falling off in tonnage, by 1920 receipts per ton per mile of 0.553 cents as compared with the 1921 figure given above of 0.679 cents. The operating expenses in 1921 totaled $12,405,728 as compared with expenses in 1920 of $12,908,982, a reduction of only $368,758. The reason for such a small reduction in expenses was increases in expenses of maintenance of way and equipment which nearly balanced a decrease of approximately $1,000,000 in transportation expenses. The road operated in 1921 with a ratio of 68.83; in 1920 it operated at 71.09. The ratio of transportation expenses to gross revenues was in 1921, 30.74 as compared with 35.87 in 1920. The Virginian in the first six months of 1922 operated at 57.93 per cent as above noted.

Physical Improvement in 1921

With its increasing net income the Virginian has been improving its property to take care of increasing business. There is much said about the building of an additional pier at Sewells Point although the management does not seem ready to commit itself as to that as yet. The outstanding developments in 1921 were the completion of double-tracking on the 2.07 per cent grade approaching Clarks Gap from the west; new construction of the so-called Virginian & Western, 14.45 miles; an extension of the Winding Gulf branch, 2.05 miles; new facilities at Elmore, W. Va.; additional shop machinery at Roanoke, Princeton, etc. The road now serves 107 coal mines, 56 of which are served jointly with the C. & O. It has 234 miles laid with 85-lb. rail and 5 miles with rail of Pennsylvania 130-lb. section.

The Virginian in 1921 had a corporate net after fixed charges of $2,937,732. Including a credit of $2,308,095 for additional compensation for operation during federal control the net income carried to profit and loss was $5,245,827. In 1920 the corporate net was $3,287,462, inclusive of a credit of $513,365 for standard return for two months. The 1920 accounts did not include any credit on account of the guaranty. The balance sheet shows as of December 31, 1921, a profit and loss credit balance of $17,416,721 "after payment of $13.00 per share on account of dividends accrued on 279,550 shares preferred stock from May 1, 1912." The company's preferred stock is 5 per cent cumulative. In 1920, 7 per cent was paid on this issue; in 1921, two payments each of 3 per cent were made. The greater part of the preferred stock is closely held. No dividends have ever been paid on the 31,271,500 common shares.

Freight Car Loading

WASHINGTON, D. C.

LOADING OF revenue freight on American railroads totaled 859,733 cars during the week ended on July 29, compared with 861,124 cars during the previous week, or a reduction of 1,391 cars. This was an increase of 64,301 cars over the corresponding week last year, but a decrease of 76,633 cars below the corresponding week in 1920. As compared with the heaviest week before the shop strike the reduction was 18,123 cars.

Coal loading totaled 76,374 cars, an increase over the previous week of 314 cars, but a decrease of 73,065 compared with the corresponding week last year, and a decrease of 109,418 cars compared with the corresponding week two years ago. Coke loading totaled 9,112 cars, a decrease of 837 cars compared with the week before. While this was an increase of 4,934 cars over the same week in 1921, it was a decrease of 4,224 cars below the same week in 1920. Ore loading totaled 64,147 cars, 270 cars below the preceding week, but 34,023 cars above the corresponding week last year. Compared with the same week two years ago, a reduction of 12,212 cars was reported.

Grain and grain products totaled 59,170 cars, an increase over the week before of 1,604, but 4,360 under the corresponding week last year. This was an increase of 19,318 cars above the corresponding week in 1920. Live stock loading amounted to 27,104 cars, 351 cars below the preceding week. This was, however, an increase of 2,294 cars above the corresponding week in 1921, and 1,039 in excess of two years ago.

Merchandise and miscellaneous freight for the week ended on July 29 totaled 565,629 cars, a reduction of 1,536 cars

REVENUE FREIGHT LOADED

SUMMARY—ALL DISTRICTS, COMPARISON OF TOTALS THIS YEAR, LAST YEAR, TWO YEARS AGO. WEEK ENDED SATURDAY, JULY 29, 1922

Districts	Year	Grain and grain products	Live stock	Coal	Coke	Forest products	Ore	Mdse. L.C.L.	Miscellaneous	Total revenue freight loaded: This year, 1922	Corresponding year, 1921	Corresponding year, 1920
Eastern	1922	11,710	2,520	8,852	1,782	5,322	7,139	66,837	94,812	198,974	.....	.....
	1921	10,961	2,642	41,583	826	4,539	2,273	56,177	73,255	.....	192,256	233,622
Alleghany	1922	4,107	2,315	19,584	4,106	3,135	13,665	50,327	79,811	177,050	.....	.....
	1921	4,120	2,479	42,891	2,062	2 526	6,675	43,591	51.395	.....	155,739	188,326
Pocahontas	1922	268	151	16,721	288	1,123	30	3,466	3,525	25,572	.....	.....
	1921	273	171	17,475	81	1,247	.....	5,051	4,041	.....	28,339	36,526
Southern	1922	4,503	2,237	14,969	774	18,029	1,062	35,370	37,941	114,885	.....	.....
	1921	4,359	1,792	19,337	313	13,963	193	35,143	35,145	.....	110,245	127,605
Northwestern	1922	11,706	7,769	7,882	1,531	15,365	39,696	30,835	40,496	155,280	.....	.....
	1921	12,813	6,476	6,807	446	10,616	19,391	27,689	33,027	.....	117,265	160,968
Central Western	1922	19,450	9,494	5,140	434	7,534	2,128	32,931	47,992	125,103	.....	.....
	1921	24,004	8,743	16,972	199	5,559	772	30,524	39,942	.....	126,715	123,989
Southwestern	1922	7,426	2,618	3,226	197	7,689	427	14,801	26,485	62,869	.....	.....
	1921	7,000	2,507	4,374	251	7,311	820	16,356	26.253	.....	64,873	65,330
Total Western Dists.	1922	38,582	19,881	16,248	2,162	30,588	42,251	78,567	114,973	343,252	.....	.....
	1921	43,817	17,726	28,153	896	23,487	20,983	74,569	99,222	.....	308,853	350,287
Total all roads	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	.....	.....
	1921	63,530	24,810	149,439	4,178	45,762	30,124	214,531	263,058	.....	795,432	.....
	1920	39,852	26,065	185,792	13,336	63,202	76,359	188,795	342,965	.....	.....	936,366
Increase compared	1921	.....	2,294	.....	4,934	12,435	34,023	20,036	68,004	64,301	.....	.....
Decrease compared	1921	4,360	.....	73,065	.....	.....	.....	45,772	.....	.....	.....	.....
Increase compared	1920	19,318	1,039	.....	.....	.....	.....	.....	.....	.....	.....	.....
Decrease compared	1920	.....	.....	109,418	4,224	5,005	12,212	.....	11,903	76,633	.....	.....
July 29	1922	59,170	27,104	76,374	9,112	58,197	64,147	234,567	331,062	859,733	795,432	936,366
July 22	1922	57,566	27,455	76,060	9,949	58,512	64,417	239,510	327,655	861,124	788,034	928,418
July 15	1922	48,911	30,216	77,334	9,698	58,121	69,162	241,180	326,285	860,907	774,884	942,851
July 8	1922	35,267	21,847	68,996	9,665	44,736	55,729	210,140	271,939	718,319	640,535	796,191
July 1	1922	41,897	28,546	94,748	10,361	61,422	64,776	247,111	328,035	876,886	776,079	891,621

American Railway Association—Car Service Division.

below the preceding week. Despite this decrease, however, the loading of merchandise and miscellaneous freight exceeded the corresponding week last year by 88,040 cars and even surpassed the corresponding week in 1920 by 33,869 cars.

Forest products totaled 58,197 cars, a decrease of 315 cars under the week before, but an increase of 12,435 cars over the corresponding week last year. Compared with the corresponding week in 1920, a reduction of 5,005 was shown.

Compared by districts, increases in the loading of all commodities over the preceding week were reported in the Alleghany, Central Western and South Western districts, with decreases in the Eastern, Pocahontas, Southern and North Western districts. All except the Pocahontas, Central Western and South Western districts, however, reported increases over the corresponding week last year.

Perfecting Plans for the Distribution of Coal

Various Agencies Involved Are Co-operating in Effort to Make Best Use of Limited Supply

WASHINGTON, D. C.

THE CENTRAL COAL Committee was able to turn more of its attention this week from the work of organization to its problem of trying to supply the many demands made upon it for coal. The district committees are now on duty and various orders for coal from railroads, public utilities and states have been forwarded to them from the Washington office.

On Monday preliminary plans were arranged for the movement of about 30,000 tons a week through the Cleveland Coal and Ore Exchange for trans-shipment across the lakes for the northwest and to increase the allocation as rapidly as possible until about 1,000,000 tons a week are moved to the lakes. In addition to C. E. Tuttle, in charge of distribution for the lake movement, C. P. White was appointed as a representative of the committee to have headquarters at St. Paul or Minneapolis.

It was believed that the action of the eastern railroads in sending shop employees to assist roads serving the coal-producing districts where shipments have recently been reduced because of congestion will result in an increased output. Consideration has been given to sending locomotives from other roads, but it was pointed out that men to keep the roads' own engines in condition would be of more service.

The problem of railway fuel supplies largely occupied the attention of the federal fuel distribution committee on Tuesday. The needs of some lines operating in the Middle States and in the Mid-West were said to be somewhat pressing, while railroads in the southeastern region were said to be in slightly better shape. The problem has been complicated by the fact that some railroads have sent buyers to the producing coal fields, and their competitive efforts to obtain fuel are having the tendency to raise prices.

The state of Massachusetts, through the state fuel administrator, has applied to Federal Fuel Distributor Spencer for emergency coal needs under Priority No. 2 classification. This coal is desired for the operation of various public utilities in that state and is in addition to coal supplies already provided for by contracts.

An appeal came from Iowa for coal for the operation of public utilities, some of which are said to face the possibility of an early closing-down if their fuel requirements are not met. A special appeal has been made for the vegetable-canning industry of the state. Farmers are also asking for coal to keep the wheat-threshers going. Maine canners have addressed an appeal to the committee. As the total tonnage required by the canning industry of the country is not especially large, it is not anticipated that there will be difficulty in meeting the needs of these establishments.

A quantity of coal in the possession of the War Department at Camp Grant, Ill., for which that department had no urgent need, was ordered turned over to railroads centering in Chicago.

The problem of the proper distribution of coal as between the seaboard states and the West was given consideration. The matter of striking a proper balance between eastbound shipments intended for New England and westbound shipments routed to points in the Middle West will require much study.

The fact that mechanics from northern states are now reporting for service in considerable numbers at the railroad repair shops of the Virginia and West Virginia coal-carrying lines is expected to relieve to some extent the car congestion which has been hampering coal production in that territory.

Numerous applications for coal have been made to Federal Fuel Distributor Spencer from industrial concerns in various states. These concerns are informed generally that their particular problems should be presented to their respective state fuel administrators.

Consideration was given to the re-establishment of restrictions on sky-rocketing prices of coal in Pennsylvania at a conference between the Pennsylvania State Coal Committee and administration officials on Wednesday.

The Interstate Commerce Commission on August 4 issued Amendment 1 to Service Order No. 23, effective on and after August 5, 1922. This amendment changes paragraph No. 7 in the following respects:

(1) Class 2 in the priority order, which follows the class of special orders, is enlarged by the addition of Clause (d), reading:

> (d) Bituminous coal which has passed over screens of four inches or larger opening, coke, and anthracite coal, to be shipped to retail dealers for household use.

(2) Class 4 is eliminated and a new Class 4 is substituted therefor, reading:

> Class 4: (As to all such common carriers by railroad) Coal for the production and manufacture of foodstuffs and medicines and for the manufacture of containers therefor, for daily use but not for storage, exchange, or sale.

The amended order also states that it is not intended to give any priority as between clauses a, b, c and d of Class 4, which relate to fuel for railroads, public utilities, government institutions and retail dealers, so that these classes are to be considered on a parity.

(3) Agents of the commission are designated and appointed with authority to give directions as to car service and to the matters referred to in paragraphs (15) and (16) of section 1 of the interstate commerce act, and referred to in paragraph No. 7. The agents, in addition to John C. Roth, director, E. H. De Groot, assistant director, and Frank C. Smith, chief inspector of the Bureau of Service, were to be stationed at the following points, beginning Monday, August 7: S. J. Mayhood, Thurmond, W. Va.; B. S. Robertson, Bluefield, W. Va.; C. C. Semple, Huntington, W. Va.; W. L. Barry, Norton, Va.; O. S. Reynolds, Knoxville, Tenn.; H. M. Priest, Louisville, Ky.; J. B. Ford, Birmingham, Ala.

The Car Service Division of the American Railway Association has issued a circular giving instructions to govern the

distribution of coal cars under the priority provisions of the commission's order, in part as follows:

(1) Requisitions for cars must show the number of cars required by each mine for each of the five classes enumerated in Service Order 23, Paragraph 7.

(2) Orders for cars in excess of a mine's demonstrated ability to load daily will not be accepted.

(3) Cars will be supplied for loading coal to be consigned in compliance with the above classes in the order named. No cars will be supplied on orders given under Class 2 until all requirements under Class 1 have been fully met. No cars will be supp ied under Class 3 until Classes 1 and 2 have been fully met and etcetera. Available cars will be distributed equitably between mines ordering cars of the same class of priority shipments.

(4) a.—The mine tage or billing instructions must show the class of priority under which the shipment is made.

b.—Revenue billing will carry the endorsement showing the class under which coal is moving.

c.—Coal will not be forwarded from mines unless mine tage or billing instructions carry this information.

(5) Railroads will maintain daily records of:

a.—All requisitions for coal cars by classes of priority.

b.—Number of cars placed for loading at each mine.

c.—Number of cars loaded and shipped by classes of priority.

Open Top Cars and Building Materials

That the greater part of the construction projects now under way will be forced to shut down for lack of construction materials unless the present coal priority order is modified was asserted by the Associated General Contractors of America in a petition of protest to the Interstate Commerce Commission. It is the opinion of the contractors that the action of the commission is so drastic as to defeat its own purpose.

The contractors are in favor of priority for coal for the first four classes established by the commission, including special purposes, government uses, public utilities, medical supplies, and domestic consumption; but contend that building materials are just as important to construction as coal is to other manufacturers, and should have equal place with it after the first four classes are served.

The petition calls attention to the fact that with the reopening of the mines the demand for cars for coal will be not less than 320,444 cars per week, of the maximum 324,000 serviceable cars, and that of these 291,000 will be suitable for the loading and transportation of coal, leaving only 33,000 open-top cars weekly for all other purposes. Going on the assumption that the coal and railway strikes will be settled, and that the present priority order stands, the contractors estimate the probable demand and supply of open-top cars, weekly during August, September, and October, will be as follows:

Commodity	Demand	Supply	Per cent supplied
Coal	320,000	291,000	91
Sand, stone and gravel	50,000	10,645	21
Ore	40,000	8,516	21
Iron and steel	25,000	5,322	22
Miscellaneous	20,000	4,258	21
Limestone	10,000	2,129	21
Coke	10,000	2,129	21

Instructions to State Fuel Committees

A letter containing detailed advice regarding the method of distribution of coal by the state fuel committees was forwarded on August 5 by Federal Fuel Distributor Spencer to the governors of the states. It stated that the federal fuel distributor will not (except for the common carriers and the departments of the United States government) act upon applications made by consumers or dealers directly to him, but will refer the applicant to his state fuel committee to the end that if his need is essential and the applicant must have emergency coal which he cannot obtain from sources within his state, the committee may then make application to the federal fuel distributor.

Governor's committees were requested to apply for coal produced in other states only through the federal fuel distributor at Washington and not to order any coal from federal fuel district committees nor producers outside of their own state.

There is no anthracite coal available for distribution by the federal fuel distributor.

Application for emergency coal to the federal fuel distributor should be made only for current use and not for storage.

Application for emergency coal should be made only for the most essential purposes following the priority classes established by the Interstate Commerce Commission in Service Order No. 23.

Emergency coal supplied on these applications made to the federal fuel distributor will be placed f. o. b. railway cars at the mines at the fair prices approved for the producing district by Secretary Hoover.

It will be the endeavor of the federal fuel distributor to place orders for emergency coal in those districts from which the supply is most available to the applicants.

John E. Benton, general solicitor of the National Association of Railway and Utilities Commissioners, has addressed a circular letter to the state commissions advising that the question had arisen whether the service orders of the Interstate Commerce Commission, made to meet the existing emergency, apply to intrastate shipments. It has been considered by the President's committee, and it is thought to be important that there shall be no doubt as to the application of the rules prescribed by those orders as to all shipments. It is thought that the question ought to be settled, so far as within the power of the regulatory authorities, state and federal, without necessity for determining the legal questions involved. It is believed that there will be no disposition anywhere at this time to do otherwise than to co-operate whole-heartedly without bringing to the front jurisdictional or other contentious questions, he said.

Commissioner Aitchison was quoted as saying, not speaking for the Interstate Commerce Commission, but for the President's Fuel Committee, that the committee desired to advise the state commissions that action on their part, so far as they have or claim car service jurisdiction, in the line of the promulgation intrastate of car service orders identical in their provisions with the car service orders already promulgated by the Interstate Commerce Commission will be appreciated, and will be helpful in the present emergency. Mr. Benton assured Commissioner Aitchison that he believed the state commissions generally, having jurisdiction, would be glad to co-operate in the establishment of common regulations, thus entirely avoiding any occasion for the question of jurisdiction arising.

It is understood that some state commissions have no jurisdiction over car service, and accordingly cannot comply with this request. At least one commission—that of Alabama—before this question arose had already adopted I. C. C. Car Service Order No. 23 in precise terms for application intrastate.

Weekly reports compiled by the Car Service Division of the American Railway Association of coal mine operations and car requirements and the open-top car situation show clearly that the worst of the effects of the shop employees' strike is concentrated on the comparatively few roads that for several months have handled practically all of the coal being produced and on which congestion and resulting car shortage had begun to appear even before the shop strike began on July 1. These are the roads regarding which there has been more or less loose talk of their being taken over by the government and the roads to which Mr. Jewell doubtless referred when he asked if the government "would constitute itself a strike-breaking agency by taking over the roads on which we have made the strike most effective."

The railroads during the week of July 22, the third week of the shopmen's strike, according to these reports placed 71 per cent of the cars required for bituminous coal loading.

or 94,627 against requirements amounting to 132,665. The low percentage is due to the conditions in the Pocahontas and Southern districts, which furnished only 43 and 49 per cent, respectively, of the cars required. In the Pocahontas district 20,412 cars were placed as against orders for 47,025 and in the Southern district 20,133 cars were placed against orders for 41,071. In the Southern district the percentage of cars placed to cars required was 99; in the Allegheny 129; in the Northwestern 102; in the Central Western 117, and in the Southwestern 101. Of 146 roads reporting, only 19 furnished less than 100 per cent. Of these the principal ones were the Wheeling & Lake Erie, 90; Baltimore & Ohio, 89; Chesapeake & Ohio, 38; Long Fork, 27; Norfolk & Western, 52; Virginian, 45; Carolina, Clinchfield & Ohio, 66; Interstate, 36; Kentucky & Tennessee, 25; Louisville, Henderson & St. Louis, 99; Louisville & Nashville, 35; Mobile & Ohio, 81; Southern, 52; and St. Louis-San Francisco, 99.

In the week of July 15 the percentage of cars placed to cars required was 84. The percentage for the Pocahontas district being 65, Southern, 56 and Southwestern, 79. For the week of July 8 the percentage for all roads was 107, only the Southern region being below 100, with a percentage of 70. During the week of July 22 the roads furnished 89 per cent of the number of open top cars required, 282,679 against 319,186. In the week of July 15 they furnished 96 per cent. In the week of July 23, 1921, the roads furnished 100 per cent and in the week of July 24, 1920, only 67 per cent. In the week of July 22 97 per cent of the requirements for limestone were furnished, 100 per cent for ore, 98 per cent for iron and steel, 97 per cent for sandstone and gravel, and 98 per cent for miscellaneous freight.

An increase in the number of cars loaded daily is shown by reports received from the carriers. On Monday, August 7, these reports showed a total of 16,021 cars loaded with coal. This total has only been exceeded on seven days since the miners' strike started on April 1, and then only by an average of a few hundred cars. The number of cars loaded daily with coal since August 1 follows:

August 1	11,783 cars
August 2	12,218 cars
August 3	12,177 cars
August 4	12,505 cars
August 5	12,317 cars
August 7	16,021 cars

In August, 1921, the average number of cars loaded daily with coal was 23,688 cars.

Reports show that on the Chesapeake & Ohio, Norfolk & Western and the Louisville & Nashville, the three largest coal carrying roads in the West Virginia and Kentucky non-union coal fields, 7,554 cars were loaded on Monday. These three roads averaged in June 7,373 cars daily, which was the heaviest month's coal loading in their history.

Standard Designs for Indian Locomotives

A Discussion of Requirements, Both Military and Fuel, and Comparisons with the U. S. R. A. Standards

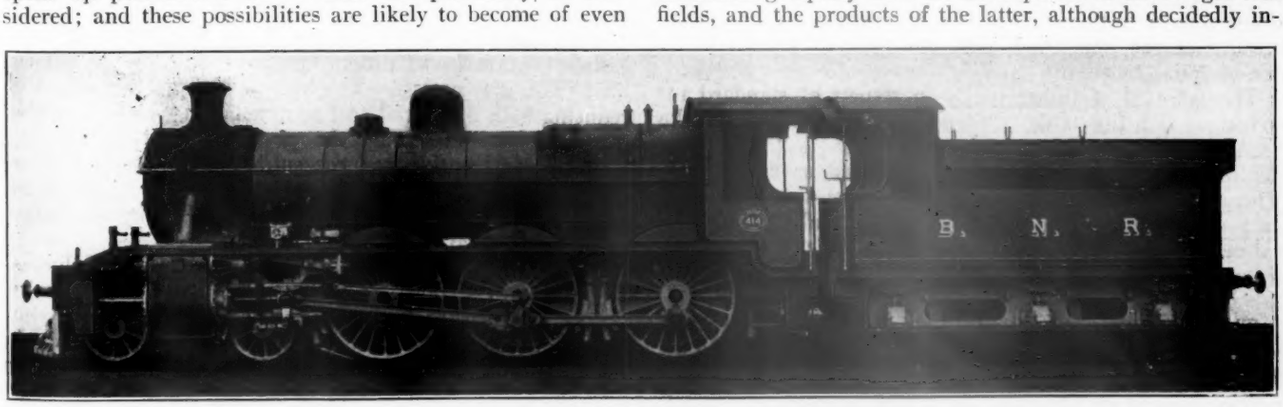
By H. L. Cole
Secretary of the Railway Board of India

LOCOMOTIVE DEVELOPMENT in India, which so far has merely followed normal British practice, appears likely in the near future to enter upon a new phase. Considerable changes are occurring in several of the most important conditions by which locomotive design has hitherto been governed in India, and these will no doubt affect future locomotive proportions in that county to no small degree. It is nearly 20 years since the existing standard locomotive designs were initiated; and with the exception of the subsequent introduction of superheaters they present no features, barring their gage, to differentiate them from the ordinary British practice of their period.

The recent revision of the fixed structure gage, however, opens up possibilities which could not previously be considered; and these possibilities are likely to become of even greater importance in view of the projected adoption either of the central automatic coupler, or at least of draft gear much stronger than that now in use. The eventual value of these two developments cannot be overlooked as aids to the solution of the now pressing problem of traffic congestion.

Changing Fuel Conditions

There is in progress, moreover, a marked change in respect to fuel supplies. Barely a quarter of a century ago, the coal requirements of Indian railways were still largely met from the United Kingdom. When the present standard engines were introduced the importation of British coal was diminishing rapidly with the development of the Bengal coal fields, and the products of the latter, although decidedly in-



Superheater Express Locomotive, Bengal-Nagpur Railway. Built by Robert Stephenson & Co.

ferior to the British coal, were good enough even with the small grates of the locomotives of that period for the moderate speeds and loads then called for. But demands on locomotive power were already becoming more exacting; and with the complete change over from British to Indian coal the necessity arose for relatively larger grate areas.

This necessity was to a certain extent recognized and provided for in the standard 4-4-0 and 0-6-0 designs of 1903; and more so in the subsequent 4-6-0, 2-8-0 and 4-4-2 engines. The development is interesting; the older 4-4-0 passenger engines on the State Railways with 17 in. by 24 in. cylinders and 17 sq. ft. of grate area, or a ratio of grate area to cylinder volume of 2.68. The 2-4-0 passenger locomotives with 18 in. by 24 in. cylinders and 20.5 sq. ft. of grate area had a ratio of 2.9. The 4-4-0 standard light passenger locomotive of 1903 with 18½ in. by 26 in. cylinders and 25.3 sq. ft. of grate area has a ratio of 3.1 and the later 4-6-0 passenger locomotives with 20 in. by 26 in. cylinders and a grate area of 32 sq. ft. has a ratio of 3.33. All these engines were designed prior to the adoption of superheaters. This increase in grate proportions was a natural expansion from these which had been based originally on experience with British coals.

At that period—only 15 or 20 years ago—there was scarcely any industrial consumption of coal in India, and rapidly as the railway demand for Bengal in place of imported coal increased, it was thought that locomotive requirements could be and would be filled by the best of Bengal coals, and for some years it was possible to a great extent to ensure this. Since then, however, a radical change has come over the whole fuel position. The available proportion of first-class Indian coal is limited. On the other hand, demands for shipping and for industries, and especially for metallurgical purposes for which it is essential to secure coals of a particular quality and with definite characteristics, have rapidly increased. It is no longer possible to pick the best local coals for railway purposes as the quantity actually available is but a comparatively small proportion of the total demand.

APPROXIMATE COMPOSITION OF SOME TYPICAL COALS

	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulphur
Indian—Raniganj	5.0	30.5	54.5	10.5	0.7
Indian—Barakar	1.0	21.0	66.0	13.0	0.7
Great Britain—Yorkshire ..	2.0	33.0	62.5	2.7	0.8
Great Britain—South Wales	1.5	16.0	70.0	11.0	1.0
American—Pennsylvania ...	1.3	34.5	57.5	7.0	1.7
American—Illinois	9.5	33.0	48.0	8.5	1.0
American—Pocahontas	Dry	19.0	75.0	5.5	0.7

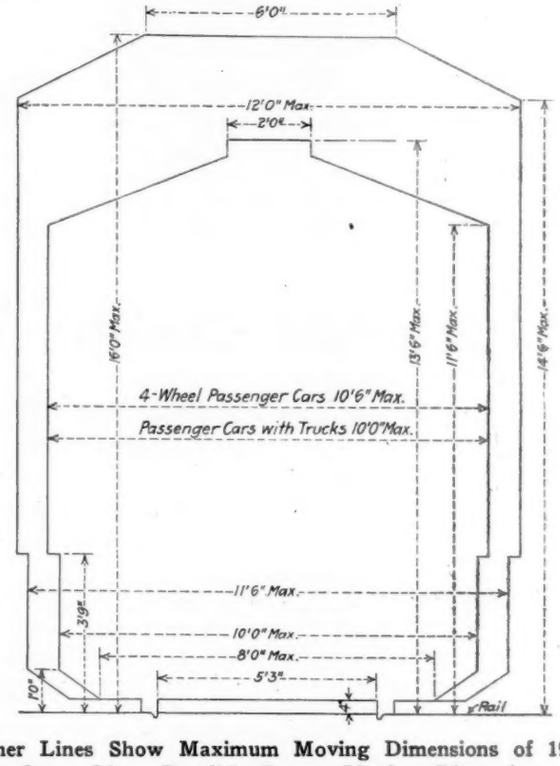
In short, railways have been forced in recent years and will certainly be forced in the future to use the poorer qualities of Indian coal in steadily increasing proportions. If efficiency is to be maintained—and we should look forward to its being steadily improved—locomotive boiler design must be adapted to the fuel conditions. In fact a stage in railway development in India has now been reached when it would appear to be a matter of imperative necessity to take account of the new conditions, and discard unsuitable or non-essential traditions.

The question of future policy in respect of standard locomotives is a live issue. "Standardization," however, like "self-determination," is a catchword, the length, breadth and depth of which are seldom clearly defined or appreciated. There can be no question as to the value of standardization as a principle, for economical production and for economical maintenance. As a practice, however, it is at least liable to result in stagnation, and to the perpetuation of obsolete designs.

The extent, therefore, to which the principle of standardization can be carried without detriment to progress or to the steady improvement of efficiency, is a matter which has important bearing on any policy that may be adopted with reference to the future development of locomotive construction and practice. There exist many important factors affecting the issue of this question, but they are substantially different in India from those that obtain either in England or in the United States.

Indian Railways in Relation to Standardization

The position of India in relation to any railway standardization program is somewhat exceptional, and this holds good in spite of the fact that there are two distinct main line gages. The meter-gage system of India, apart from its considerable mileage, is generally of a fairly high standard; neither the Burma nor the old Rajputana-Malwa meter-gage railways, for example, can be classed as light railways. Each gage, the 5 ft. 6 in. and the meter, is constructed practically to a standard that is common to all railways of that



Inner Lines Show Maximum Moving Dimensions of 1921; Outer Lines Possible Future Moving Dimensions

gage. Bridge rules also are uniform, and while occasionally variations have been permitted for particular reasons, speaking broadly it may be said, in respect to loading gages and running dimensions there has been maintained from the earliest days a consistent, well-considered, and well co-ordinated policy.

This may have been of greater or less benefit to individual railways at different times; but the result at the present day, when it is necessary to explore every possible means of reducing both the initial cost of new locomotives and rolling stock, and of increasing the possibilities of interchange, whether for frontier war concentrations or for peace-time traffic emergencies, is of first-class importance, in that it removes one of the first great obstacles in the way of a practical standardization program.

With rare exceptions, such as the Bombay and Baluchistan mountain sections, operating conditions throughout India are not marked by extreme variations. A general similarity of practice, at least in broad essentials, is no doubt partly an outcome of uniform loading gages, but it is also a natural result of a certain degree of technical co-ordination which always has been maintained between the various

railway administrations and the Government of India. The standard engines of 1903 merely replaced an older series, examples of which could be found running on lines as far apart as Madras and Peshawar. Recommended locomotive and rolling-stock designs exhibited in the old Locomotive and Carriage and Wagon Superintendents' Committee's proceedings of 1890 and onwards drafted in effect a standardization policy which appears to have been accepted as a practical working proposition.

Another not unimportant factor consists in a broad uniformity of fuel supplies in India, in the sense that the main standby is bituminous coal—variable in quality, certainly; but neither so good as British steam coal on the one hand, nor on the other hand so diversified in quality and nature as the various anthracite, bituminous, and sub-bituminous or lignitic coals in use on different American railways. The variation between the best first class and the worst second class Bengal coals is not so serious a matter as to form any real obstacle to standardization if that be desirable on other grounds. The fuel position, difficult is it may be, is not so grave as to require that the mail-train locomotives be provided with boilers suited to burn the poorer qualities of second class coal; nor will many railways contemplate obtaining under present or prospective conditions supplies of first class coal for ordinary slow-speed services. The known supply of first class Indian coal is limited; whereas the supply of second class is abundant, and only awaits development.

Military Considerations

One important factor in the consideration of a standardization policy has been touched upon already but needs emphasis. India possesses dangerous land frontiers. It is a necessary insurance, therefore, that provision should exist for the possible necessity of having to effect a great military concentration at any time and at short notice; locomotives of 5 ft. 6 in. gage cannot readily be borrowed from abroad and there would be no time to build them. But India cannot afford to maintain an idle reserve of locomotives awaiting such an emergency. The demand, should it arise, must consequently be met from existing resources; in other words, from various railways all over India. No argument is needed to elaborate the value and economy of having standard power under such conditions, or the vast amount of trouble in the thick of heavy troop-traffic, due to having a variety of power and an infinity of different detailed parts to maintain.

Standardization in Principle and Practice

If we turn to America for indications of the trend of modern practice, or for specific data upon which to work out new designs, it is because American railways have been up against high labor costs and indifferent fuel longer than India has, and because India possesses neither the accumulated test results nor the resources for obtaining such results locally. The railways of the United Kingdom, on the other hand, have never suffered from poor quality fuel; the service rendered by British labor prior to the war was efficient in relation to its cost, and the results of experiments, where made, are for the most part buried in the records of the particular railways to which they pertain. Moreover, Indian operating conditions in respect of the average length of runs, high car axle-loads, and consequently the value of full train-loads and maximum engine-rating as against a rapid turn-around of very low capacity stock, are in general more similar to conditions in the United States than to those that obtain in the United Kingdom.

Outside the Indian standard locomotive scheme, it would probably have been difficult until recently to find anywhere in the world a series of engines serving so great an area and designed under circumstances so favorable to consistent practice in respect to weight, boiler and tractive effort ratios.

During the war, however, a series of standard locomotives was designed under the authority of the United States Railroad Administration; and some hundreds—nearly 2000—of those standard engines were constructed. Now the United States, in common with Great Britain, has a considerable variety of loading gages; they have also a wide variety of operating conditions, and a far greater range of fuels in actual use on railways than is the case in India. And there are roughly 70,000 locomotives in service on American railroads. Locomotive standardization, therefore, as a policy in common between American railways generally was then and is at the present time not really a practical issue.

This may serve as an illustration of the deliberate adoption of a standardization program devised specifically and solely with the object of rapid and economical manufacture, practically irrespective of the operating or maintenance con-

DIMENSIONS AND PROPORTIONS OF STANDARD INDIAN LOCOMOTIVES

Type	4-4-0	4-4-2	4-6-0	4-4-0	4-6-0	0-6-0	2-8-0	0-6-0	2-8-0
Service	Pass.	Pass.	Pass.	Pass.	Pass.	Freight	Freight	Freight	Freight
Saturated or superheated	Sat.	Sat.	Sat.	Sup,	Sup.	Sat.	Sat.	Sup.	Sup.
Cylinders, diameter and stroke, in	18½ by 26	19 by 26	20 by 26	20 by 26	20½ by 26	18½ by 26	20 by 26	20 by 26	22 by 26
Weights in working order:									
On drivers, lb	70,560	78,400	107,520	75,040	113,570	107,520	141,120	111,100	143,360
On trucks, lb	41,440	71,680	35,840	43,460	43,900	.....	17,920	.....	20,160
Total engine, lb	112,000	150,080	143,360	118,500	157,470	107,520	159,040	111,100	163,520
Tender, lb.	87,360	105,280	91,840	90,500	106,850	87,360	105,280	90,500	105,280
Driving wheels, diameter, in	74	78	73	74	73	61	56	61	56
Boiler pressure, lb	180	180	180	160	160	180	180	160	160
Grate area, sq. ft	25.3	32	32	25.3	32	25.3	32	25.3	32
Heating surfaces:									
Firebox, sq. ft	128	157	157	127	152	128	173	127	172
Tubes, sq. ft	1,230	1,833	1,674	951	1,419	1,230	1,914	951	1,598
Total evaporative, sq. ft	1,358	1,990	1,831	1,078	1,571	1,358	2,087	1,078	1,770
Superheating, sq. ft	.....	.....	.....	240	407	.....	.....	223	389
Combined evap. and sup., sq. ft	.....	.....	.....	1,318	1,978	.....	.....	1,301	2,159
General data, estimated:									
Rated tractive force, 85 per cent, lb	18,360	18,360	21,879	19,040	20,400	22,338	28,458	23,120	30,600
Cylinder horsepower	1,026	1,082	1,199	1,153	1,212	1,026	1,199	1,153	1,394
Weight proportions:									
Weight on drivers ÷ tractive force, lb	3.84	4.27	4.92	3.94	5.57	4.81	4.96	4.81	4.73
Weight on drivers ÷ total weight, engine — per cent	63.0	52.3	75.0	63.3	72.1	100	88.7	100	87.7
Total weight, engine ÷ cylinder horsepower — lb.	109	139	119	103	130	105	133	96	117
Boiler proportions:									
Comb. heating surface ÷ cylinder horsepower	1.32	1.84	1.53	1.14	1.63	1.32	1.74	1.13	1.55
Tractive force ÷ comb. heating surface	13.52	9.23	11.95	14.44	10.32	16.44	13.64	17.77	14.17
Tractive force × dia. drivers ÷ comb. heating surface	1,000	719	872	1,067	754	1,003	764	1,083	794
Cylinder horsepower ÷ grate area	40.5	33.8	37.5	45.4	37.9	40.5	37.5	45.4	43.6
Firebox heating surface ÷ grate area	5.05	4.90	4.90	5.04	4.75	5.05	5.72	5.06	5.63
Firebox heating surface ÷ evap. heating surface — per cent	9.42	7.89	8.58	11.78	9.67	9.42	8.29	11.78	9.72
Superheating surface ÷ evap. heating surface — per cent	.....	.....	.....	22.2	25.9	.....	.....	20.7	22.0

ditions of individual railways. From the point of view of individual railways, therefore, this standardization scheme had little to recommend it. It involved proportions unsuited to various local conditions, power below the capacity of particular lines, and details which did not duplicate those of existing engines even of corresponding dimensions. But these standardized designs did enable manufacturers to carry out a heavy production program; and that was the need of the moment—essentially a war measure.

No standardization policy, however, can be considered as really practical or satisfactory as a normal peacetime measure, if it fails to make provision for progressive improvements in designs, on a basis of added knowledge, or of modification in practice to meet changes in conditions. A certain degree of elasticity is necessary for progress; standards cannot be fixed for all time. Standardization is an expedient for the cheap production of approved designs, and for the easy and economical renewal of worn parts. It should never and need never be a device for the perpetuation of obsolete designs. It is a false conception of the practical value of standardization to refer to the policy as if it involved finality.

To the extent that a standard locomotive policy has already long been recognized in principle on Indian railways, there is indeed no need for stagnation, but there is a certain basis for a consistent forward policy. More exacting demands, denser traffic, point already to the need for heavier trainloads without sacrifice of speed. Alterations in the loading gage and the contemplated improvement in the coupler indicate substantial possibilities in that direction. The spacing of double tracks and renewal of bridges, regrettably in arrears on certain highly congested trunk lines, must certainly precede the use of the heavier trains that would help so powerfully to ease the traffic situation.

Of even more pressing importance than these, probably, is the necessity of providing for the widely extended use of fuel which has hitherto been regarded as of too low a grade for railway requirements. This will perhaps be the most potent factor in the immediate future in deflecting Indian locomotive practice from ratios and wheel arrangements which have hitherto been accepted as normal.

An examination of the table showing the general dimensions and proportions of the standard Indian locomotive indicates apparent inconsistencies. It must, however, be remarked that these designs were not brought out simultaneously, that they are all somewhat old, and that the superheater-fitted engines were not originally designed as such, but are old saturated steam locomotives altered to take superheaters.

At the same time this examination suggests the possibility of the present position leading to the adoption of modifications in view of the experience gained with the standards initiated in 1903, as well as in the light of developments elsewhere. Attention is especially drawn in this connection to the U. S. R. A. standard light Pacific and light Mikado locomotives.

In respect of adhesion, speaking broadly, Indian climatic conditions should certainly permit of an adhesion ratio not exceeding four to one in the case of normal designs, and probably 4.5 to 1 in the case of compound articulated engines. On the U. S. R. A. passenger and freight engines the ratio was approximately 4 to 1.

The U. S. R. A. light Pacific locomotive had 1.84 sq. ft. and the light Mikado 1.91 sq. ft. of heating surface per cylinder horsepower; the ratio of tractive force to combined heating surface was 9.85 for the Pacific and 11.73 for the Mikado; the tractive force multiplied by the diameter of the drivers and divided by the combined heating surface was 719 for the Pacific and 740 for the Mikado; the Pacific had 33.8 and the Mikado 36.5 cylinder horsepower per square foot of grate area; the firebox heating surface was about 8 per cent of the evaporative heating surface on the Pacific and 7.4 per cent on the Mikado. On both locomotives there was a little over 4 sq. ft. of firebox per square foot of grate and the superheater surface was between 23 and 24 per cent. of the evaporative heating surface.

The ratio of total weight to tractive effort ratio of the I. S. R. Atlantic engine is notably bad. This may lead to the rejection of the type, and the adoption of six-wheels coupled as regular passenger locomotive practice. With fares so low as those in force in India—not two cents per mile, but two to two and one-half miles for one cent for third-class passengers—loads must be good to be remunerative. Nevertheless, there appears to be as yet no necessity nor any inclination to proceed to the eight-coupled passenger engine on Indian railways. If this seems inconsistent, it should be noted that Indian 5 ft. 6 in. gage passenger cars with four wheel trucks, weigh barely 30 tons, as a rule, a fact which also supplies a reason for the relatively light engines in use as compared with modern American passenger engines.

As to future wheel arrangements, apart from the number of wheels coupled, it seems fairly certain that it will be necessary to adopt trailing radial axles in order to accommodate the larger grates that will have to be employed to utilize in the future inferior grades of coal. We may expect, therefore, to see on Indian broad gage railways in the near future, 4-6-2 and 2-8-2 types in supersession of the present standard passenger and freight engines respectively.

There appears to be no early prospect of any advance beyond the 2-8-2 freight engine, except on ghât or mountain sections, at any rate as a standard; partly because present operating conditions do not favor trains exceeding about 2,000 ft. in length, and partly because in any case very heavy preliminary expenditures on siding extensions, loops and other works will be necessary, and this can only be spread over a number of years. The coupler question is also involved, but this is already under consideration and may be settled on lines that will remove it from the list of obstacles to heavy freight movements.

WHISTLE LEVERS are being installed on the fireman's side of 175 locomotives on the Missouri, Kansas & Texas.

Photo by Keystone

Strikers Watching Entrance to D. L. & W. Shops, Hoboken, N. J.

General News Department

L. A. Downs, vice-president and general manager of the Central of Georgia, has been elected an honorary corresponding member of the National College of Italian Railway Engineers. Mr. Downs was president of the American Railway Engineering Association last year and was a delegate from the United States to the International Railway Congress in Rome last May at which time this honor was conferred upon him.

To Operate Part of Kansas City Northwestern

Business men living in towns along the defunct Kansas City Northwestern held a meeting at Seneca, Kan., last week to consider the possibility of operating electric cars over the line, which suspended operations except at terminals in March, 1921. The north terminal of the road is at Virginia, Neb., and it is proposed to operate cars from that point to Beatrice over the tracks of the Chicago, Rock Island & Pacific. Plans for a general renewal of operations are, however, still tentative.

Southern Pacific Asks New Hearing in Dissolution Case

The Southern Pacific on July 31 filed in the Supreme Court of the United States an application for a rehearing of the case in which the court recently ordered the separation of the Southern Pacific and the Central Pacific. The court had given permission to file the petition, but no action can be taken on it until the court meets for its next term in October.

The company grouped the grounds advanced for the re-hearing under five heads and among other things urged an application of the Sherman act "in the light of the rule of reason," insisting that under the laws of California there was authority for the lease made by the Central Pacific in 1885, which, if valid, constituted the Southern Pacific proprietor of the Central Pacific for 99 years.

The petition asserted that it was not the intention of the Sherman act to "subvert titles vested before its passage" and that Congress in considering the refunding of the Central Pacific debt always looked "for a guaranty of its payment by the Southern Pacific."

The petition further stated that the Sherman law "should not be interpreted as requiring the disintegration of railroad lines which in the 50 years of their history have had a community of operation through a single management of unbroken continuity." All consolidations, leases and conveyances of California companies holding federal franchises to construct and operate railroads were made upon the basis which prevailed in the Central Pacific lease, and "have stood unchallenged from earliest times."

The Federal Refunding Committee "was clearly coupled with authority," the petition continued, "to make a settlement calling for a guaranty by the Southern Pacific predicated upon its position as lessee, inasmuch as such a settlement was in line with what had always been regarded in Congress as practically indispensable to refunding."

The opinion of the court, the petition said, "fails to do justice to the moral or legal aspects of our case under the settlement," in that it leaves out of consideration governmental action from 1885 to 1898 "indispensable to a sound interpretation of the powers conferred upon the (refunding) commission and the settlement made by it."

The opinion also "ignores the lease as the predicate upon which the guaranty was requested and given . . . claiming that it "assumes that the commission did not request but merely, unresistingly, appointed the guaranty."

The decision of the court is further criticized on the ground that "it ignores the fact that without the guarantee the government could not have obtained payment of the debt"; also that "it takes no account of the fact that without the concurrence of the Southern Pacific the Central Pacific could not have complied with the terms of the agreement of settlement which required the lease of the Southern Pacific to be subordinated to the bonds issued by the reorganized company," and that "it ignores the fact that it was the first duty of the commission to familiarize itself with the plan of reorganization and to satisfy itself that it was adequate to insure the payment of the government debt within 10 years.

The company asked an opportunity for counsel to present an argument on that part of the opinion relating to the apportionment or use of certain properties "constructed or acquired during the unified control of the two systems," contending that "propositions upon which they may be thought to rest were never presented by any pleading, never mentioned in the taking of evidence, at no time argued . . . and are not to be supported by any rule heretofore announced or applied" by the Supreme Court.

Prosperity in Steel and Lumber

The Bureau of Economics of the National Lumber Manufacturers Association reports in its monthly "Graphic Summary of Business Statistics" that the two broad bases of prosperous manufacturing in the United States—steel and lumber—are now virtually normal or better. The latest available monthly figures put pig iron production at 93, raw steel at 98 and lumber at 117 per cent of the normal, which is assumed to be the average for the last 10 years.

In a large measure 17 other significant statistics support the lumber and steel indication of returned "normalcy." Time money rates are 82 per cent of normal; call money 98 per cent; industrial dividends (volume) 100 per cent; New York bank clearings, 100; average price of twenty industrial stocks, 110; twenty railroad stocks, 93; New York stock exchange business, 157; bank clearings outside of New York, 119; business failures, 151 per cent; unfilled steel tonnage, 79; merchandise imports, 102; merchandise exports, 77; authorized capital of new corporations—for June—60 per cent; lumber shipments, 130; lumber orders, 146; Bradstreet's commodities price index, 90 per cent; bituminous coal production (despite the strike), 59 per cent; estimated cost of new buildings in 20 cities for June, 236 per cent.

Convention and Vacation Traffic Heavy

To accommodate the many conventions and the heavy vacation travel of the past spring and early summer the railroads and the Pullman Company provided 1,905 special sleeping cars for convention traffic, in addition to 1,719 extra pullmans during the few days following June 28, to handle the holiday traffic. In June, the Chicago, Rock Island & Pacific alone handled almost 50 special passenger trains which carried about 10,000 paying passengers, and comprised approximately 400 sleeping cars, coaches, etc. A better idea of the recent demand for extra equipment made by conventions, sporting events, and early summer travel may be gained from the following figures: For the Knights Templar Conclave held in New Orleans, La., 284 extra sleeping cars were used; the Investment Bankers' Association, 22 cars; the Rotary clubs' convention, 167 cars; advertising clubs, 38 cars; Shriners' convention, 688 cars; United Confederate Veterans' reunion, 117 cars; Kiwanis clubs, 23 cars; Derby Day, Louisville, Ky., 218 cars; Indianapolis, Ind., auto races, 95 cars. The reduced railroad rates from Los Angeles, Cal., to the East required the use of 253 additional cars. Figures available regarding the number of extra sleeping cars in use from the principal Eastern points during the last of June and the first part of July are distributed as follows: Northwestern territory (N. Y. C., N. Y., N. H. & H., P. L. & W., Erie) 896 cars; southeastern territory (Penna., B. & O., C. & O., L. V.) 472 cars; southern points. 107 cars; Chicago, except P. R. R., B. & O., N. Y. C., Big Four, 244 cars.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Akron, Canton & Youngstown	June	170	$186,785	$1,110	$198,848	$22,776	$20,332	$6,501	$55,067	$9,159	$113,849	57.30	$84,999	$73,999	$41,292	$22,242
	6 mos.	170	1,018,330	8,222	1,071,614	107,800	111,224	34,054	284,267	52,551	589,483	55.00	482,131	424,044	270,567	—1,128
Alabama & Vicksburg	June	141	203,732	60,460	281,735	49,546	57,163	10,227	97,340	11,808	228,171	81.00	53,564	34,065	38,361	—25,046
	6 mos.	141	1,140,928	329,054	1,575,090	277,024	312,391	53,701	568,711	71,105	1,293,924	82.20	281,166	156,504	175,895	—117,622
Vicksburg, Shreveport & Pac.	June	171	230,453	97,496	350,342	52,234	60,717	10,767	124,791	13,575	264,563	75.50	85,779	62,841	54,735	40,696
	6 mos.	171	1,214,483	539,369	1,881,316	352,689	300,457	62,611	721,198	80,306	1,530,415	81.30	350,901	231,612	181,381	55,242
Ann Arbor	June	293	371,055	43,954	435,353	62,559	74,459	9,112	175,667	20,109	341,906	78.50	93,447	70,647	51,306	24,823
	6 mos.	293	2,072,774	248,176	2,413,075	287,294	408,785	56,405	1,063,712	84,973	1,901,237	78.80	511,838	385,713	255,382	12,831
Atchison, Topeka & Santa Fe	June	8,855	10,083,872	4,120,633	15,524,584	3,263,155	3,420,274	265,158	4,631,389	325,416	11,880,517	76.50	3,644,067	2,595,290	2,725,943	5,238,927
	6 mos.	8,857	55,478,980	20,691,728	83,402,328	14,874,821	20,735,931	1,572,781	27,301,281	2,006,079	66,439,994	79.70	16,962,334	10,756,490	11,522,790	15,041,276
Gulf, Colorado & Santa Fe	June	1,907	1,390,722	364,915	1,892,718	383,354	407,669	43,018	581,018	63,995	1,477,475	78.10	415,243	340,364	275,954	897,879
	6 mos.	1,907	7,412,637	1,839,118	9,994,276	2,395,968	2,694,152	252,082	3,489,260	409,304	9,236,384	92.40	757,892	360,810	—26,132	1,781,907
Panhandle & Santa Fe	June	857	407,476	132,502	574,661	218,904	134,534	7,734	171,646	17,943	549,212	95.50	25,449	2,541	—26,605	244,008
	6 mos.	857	2,500,598	644,010	3,471,006	928,573	1,144,103	41,292	1,191,136	113,336	3,411,992	98.30	59,014	—78,414	—266,165	195,116
Atlanta & West Point	June	93	98,994	75,866	207,363	27,162	39,203	7,352	74,865	10,601	165,667	79.90	41,696	29,320	23,334	—15,311
	6 mos.	93	575,746	409,150	1,147,232	141,085	248,891	45,805	452,615	61,768	973,793	84.90	173,439	112,149	68,529	21,027
Western of Alabama	June	133	121,203	66,169	213,381	25,555	42,139	8,030	65,446	11,108	158,265	74.20	55,116	44,590	46,706	12,476
	6 mos.	133	683,472	371,223	1,194,732	148,785	278,855	50,297	398,732	65,215	961,955	80.50	232,777	178,547	180,334	55,343
Atlanta, Birmingham & Atlantic	June	639	248,610	36,031	312,517	59,737	90,394	20,776	166,719	15,706	353,398	113.10	—40,881	—55,460	—67,687	—187,542
	6 mos.	639	1,497,313	191,772	1,842,846	351,003	531,771	127,095	948,942	95,045	2,054,405	111.40	—211,559	—300,703	—374,906	—1,020,818
Atlantic Coast Line	June	4,922	4,007,037	1,093,025	5,571,036	668,310	1,281,314	93,198	2,063,486	132,491	4,266,630	76.60	1,304,406	1,027,798	956,249	—24,840
	6 mos.	4,923	25,705,491	8,547,819	37,095,580	4,097,740	7,051,317	642,509	13,087,950	826,003	25,917,517	69.90	11,178,063	9,564,834	8,845,354	3,170,358
Charleston & Western Carolina	June	342	218,351	37,057	271,725	46,018	34,311	6,674	106,037	6,137	199,177	73.30	72,548	61,540	54,198	—73,755
	6 mos.	342	1,420,580	216,552	1,724,476	273,600	223,820	40,126	691,022	38,780	1,257,348	73.50	457,128	390,505	335,250	—202,150
Baltimore & Ohio	June	5,235	13,870,834	3,449,226	17,580,515	1,900,941	4,340,037	307,910	6,566,222	474,521	13,776,907	78.40	3,803,608	3,069,386	2,666,332	321,133
	6 mos.	5,235	79,325,814	12,910,208	98,679,159	11,704,269	22,377,895	1,785,190	38,060,865	2,867,708	77,698,924	78.70	20,980,235	16,697,276	14,580,295	7,630,464
Baltimore & Ohio Chic. Term	June	91	.....	.....	290,213	54,302	30,059	1,675	138,368	11,281	240,050	82.70	50,163	—1,234	98,120	25,376
	6 mos.	91	.....	.....	1,477,424	221,143	187,704	11,462	814,158	61,418	1,319,911	89.30	157,513	—125,093	567,531	161,548
Staten Isl. Rapid Transit	June	23	63,767	113,914	202,266	65,626	26,231	1,893	123,338	13,494	230,582	114.00	—28,316	—46,335	—59,114	—12,810
	6 mos.	23	476,300	562,493	1,151,808	300,869	184,012	11,715	682,622	82,268	1,261,486	109.40	—109,678	—212,224	—294,225	—200,343
Bangor & Aroostook	June	625	471,032	67,261	562,672	144,362	146,387	3,830	159,640	26,072	482,727	85.80	79,945	44,415	56,685	35,755
	6 mos.	525	3,901,688	449,239	4,488,387	708,137	764,524	24,695	1,193,866	119,170	2,813,712	62.70	1,672,675	1,336,242	1,353,125	355,504
Belt. Ry. Co. of Chicago	June	32	.....	.....	501,780	77,412	51,848	2,597	201,699	19,965	343,521	68.50	158,259	—124,886	131,957	132,443
	6 mos.	32	.....	.....	2,890,726	277,521	315,643	12,209	1,262,027	59,466	1,926,866	66.70	963,860	—751,577	828,984	803,709
Bessemer & Lake Erie	June	225	1,337,524	26,210	1,389,042	133,206	365,442	17,122	382,262	27,321	929,794	66.90	459,248	426,539	461,629	587,968
	6 mos.	225	4,368,930	176,583	4,664,649	636,629	1,766,735	93,944	1,612,869	153,363	4,293,098	92.00	371,551	175,111	365,618	—82,556
Bingham & Garfield	June	34	22,913	.....	23,625	14,789	3,439	1,565	6,265	3,716	29,935	126.70	—6,310	—10,554	2,911	—31,111
	6 mos.	34	81,458	6	82,380	101,310	21,106	7,958	28,518	25,127	184,315	223.70	—101,935	—133,002	—77,086	—115,397
Boston & Maine	June	2,287	3,994,746	1,778,322	6,523,383	1,110,193	1,211,164	54,324	2,680,479	212,256	5,289,782	81.10	1,233,601	1,005,832	758,833	—159,368
	6 mos.	2,287	23,591,119	10,298,737	37,848,763	5,813,127	7,220,571	334,974	17,559,103	1,329,796	32,402,799	85.60	5,445,964	4,282,699	2,767,091	—4,485,385
Brooklyn Eastern Dist. Term	June	9	118,546	.....	127,723	8,501	12,735	487	49,303	4,579	75,605	59.20	52,118	45,531	45,531	19,055
	6 mos.	9	750,639	.....	797,420	33,200	112,329	1,294	299,248	29,046	475,117	59.60	322,303	283,732	283,732	146,437
Buffalo & Susquehanna	June	253	61,114	4,186	68,622	32,474	30,215	2,424	28,421	9,966	103,500	150.80	—34,878	—38,128	—32,983	—35,763
	6 mos.	253	670,413	36,528	731,747	184,750	235,124	13,171	266,012	55,055	754,112	103.10	—22,365	—41,902	58,639	—50,849
Buffalo, Rochester & Pittsburgh	June	589	743,249	125,059	945,708	293,326	390,196	19,657	394,673	40,296	1,139,845	120.50	—194,137	—229,187	—186,917	31,093
	6 mos.	589	5,840,182	785,434	6,942,958	912,234	2,518,790	104,468	2,715,009	228,009	6,491,504	93.50	451,454	237,152	406,499	333,104
Canadian Pacific (Lines in Me.)	June	233	154,581	32,654	201,647	40,221	27,913	4,587	78,657	3,717	155,095	76.90	46,552	30,552	12,591	—49,681
	6 mos.	233	1,210,023	201,734	1,508,504	215,812	272,596	25,818	711,440	22,200	1,247,866	82.70	260,638	164,638	83,381	—4,096
Carolina, Clinchfield & Ohio	June	295	645,436	39,490	699,220	67,537	155,385	24,432	150,932	25,795	423,578	60.60	275,642	235,622	321,916	186,580
	6 mos.	295	3,574,170	220,049	3,863,255	446,831	899,757	142,042	951,739	113,427	2,551,561	66.10	1,311,694	1,071,206	1,506,416	962,718
Central of Georgia	June	1,920	1,344,076	441,344	1,993,095	263,520	353,785	58,086	727,100	75,757	1,486,174	74.60	506,921	395,207	403,140	152,922
	6 mos.	1,917	7,307,486	2,394,378	10,747,997	1,422,225	2,075,574	396,359	4,180,010	446,939	8,559,701	79.60	2,188,296	1,651,310	1,747,837	97,209
Central of New Jersey	June	688	2,360,388	808,455	3,443,405	524,649	1,026,419	27,722	1,558,789	102,366	3,258,324	94.60	185,081	—75,761	—112,518	688,283
	6 mos.	688	17,489,173	4,160,582	23,199,980	2,538,130	6,586,164	202,126	9,686,569	626,355	19,737,835	85.10	3,462,145	1,901,239	1,681,722	3,073,510
Central Vermont	June	407	394,191	87,475	542,133	97,725	115,258	11,550	259,413	18,253	503,676	92.90	38,457	21,398	—1,475	—117,817
	6 mos.	407	2,330,873	522,858	3,168,328	433,493	597,225	67,882	1,647,689	136,177	2,891,270	91.30	277,058	174,445	21,977	—850,415
Chesapeake & Ohio	June	2,547	7,491,175	982,567	8,870,114	1,145,380	2,119,118	81,119	2,663,858	157,583	6,191,743	69.80	2,678,371	2,410,053	2,452,539	1,944,753
	6 mos.	2,547	37,273,439	4,912,408	44,172,859	5,103,559	11,251,434	456,542	15,379,255	966,056	33,273,392	75.30	10,899,467	9,288,282	9,644,657	5,041,318
Chicago & Alton	June	1,050	1,535,889	565,122	2,306,082	402,450	615,723	59,904	869,831	58,466	2,014,208	87.30	291,874	216,576	88,339	11,735
	6 mos.	1,050	10,054,897	2,981,031	14,132,672	1,615,077	3,878,200	337,704	5,440,108	346,998	11,693,937	82.70	2,448,735	1,996,603	1,154,084	—44,825
Chicago & Eastern Illinois	June	945	1,445,153	408,592	2,010,422	289,420	586,787	44,180	811,166	66,580	1,808,860	90.00	201,562	115,756	60,797	93,777
	6 mos.	945	8,839,315	2,201,924	11,903,154	1,366,621	3,137,054	253,246	4,876,613	397,430	10,098,954	84.80	1,804,200	1,290,880	1,119,477	—380,322
Chicago & North Western	June	8,402	9,392,153	2,762,913	13,665,322	2,144,311	2,628,629	168,699	5,172,081	303,960	10,506,547	76.90	3,158,775	2,426,609	2,389,331	894,039
	6 mos.	8,402	46,063,556	14,257,018	67,660,620	8,777,326	14,537,903	890,891	30,217,918	1,866,708	56,707,469	83.80	10,953,160	6,556,429	6,331,403	—3,567,055
Chicago, Burlington & Quincy	June	9,393	9,067,361	2,576,326	13,084,755	2,155,061	2,781,705	201,682	4,606,853	383,965	10,205,871	78.00	2,878,884	1,961,361	1,776,039	2,340,197
	6 mos.	9,393	54,692,883	12,967,703	74,635,952	9,505,390	15,976,044	1,104,294	27,513,009	2,075,912	56,723,894	76.00	17,912,058	12,386,073	11,659,072	16,672,390
Chicago Great Western	June	1,496	1,500,729	370,486	2,038,290	430,259	456,281	73,470	802,506	54,593	1,830,324	89.80	207,966	129,275	—13,927	170,518
	6 mos.	1,496	8,214,538	2,059,937	11,323,144	1,652,686	2,790,078	390,228	4,952,230	340,614	10,205,337	90.10	1,117,807	628,067	—148,449	284,147

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Chicago, Ind. & Louisville	June	654	$959,246	$265,599	$1,358,651	$152,314	$292,584	$35,010	$517,100	$36,485	$1,047,247	77.10	$311,404	$244,725	$142,220	$57,747
	6 mos.	654	5,537,481	1,530,349	7,757,916	819,412	1,720,485	194,838	2,873,178	213,114	5,898,269	76.00	1,859,647	1,479,989	868,136	—778
Chicago, Milwaukee & St. Paul	June	11,030	9,720,557	2,239,056	13,513,554	2,122,045	3,464,172	204,505	4,959,964	341,446	11,175,668	82.70	2,337,886	1,533,726	1,215,105	807,090
	6 mos.	11,030	52,115,128	11,405,494	71,156,775	9,236,371	19,421,487	1,113,818	30,427,142	1,976,711	62,544,874	87.90	8,611,901	3,790,425	1,617,155	—2,815,724
Chicago, Peoria & St. Louis	June	246	144,429	13,799	168,092	31,533	43,122	5,483	108,442	10,662	199,242	118.50	—31,150	—40,674	—66,492	—37,231
	6 mos.	246	947,236	115,775	1,133,185	183,710	251,423	26,652	664 335	63,855	1,189,975	105.00	—56,790	—113,887	—248,100	—382,095
Chicago River & Indiana	June	38	.....	.....	594,994	64,110	59,491	510	230,924	5,156	360,191	60.50	234,803	190,359	267,017	.....
	6 mos.	38	.....	.....	792,263	87,995	82,070	733	315,919	8,183	494,900	62.50	297,363	238,496	345,479	.....
Chicago, R. I. & Pacific	June	7,661	7,465,396	2,505,328	10,733,758	1,379,939	2,296,528	195,041	4,001,966	225,139	8,163,984	76.10	2,569,774	2,024,764	1,783,169	1,080,714
	6 mos.	7,661	39,202,214	12,640,192	56,053,682	7,240,761	12,661,951	1,062,084	23,848,496	1,397,909	46,444,592	82.90	9,609,090	6,416,478	4,971,126	4,513,424
Chicago, R. I. & Gulf	June	461	388,155	80,731	516,269	92,210	57,957	14,638	208,494	14,174	386,830	74.90	129,439	118,279	99,024	105,525
	6 mos.	461	2,005,480	452,689	2,716,060	386,675	486,675	82,566	1,255,387	84,013	2,299,533	84.70	416,527	346,465	240.305	375,594
Chic., St. Paul, Minn. & Omaha	June	1,749	1,691,398	568,943	2,466,833	306,742	473,554	35,308	1,003,274	72,985	1,902,868	77.10	563,965	430,644	400,904	152,306
	6 mos.	1,749	9,097,581	3,001,908	13,056,451	1,626,297	2,561,322	198,432	6,161,951	434,583	11,039,360	84.60	2,017,091	1,225,072	1,030,376	—769,032
Cincin., Indianapolis & Western	June	347	304.131	52,312	376,757	46,381	79,735	13,636	150,300	19,640	312,461	82.90	64,296	47,760	19,437	—114,345
	6 mos.	347	1,637,388	294,355	2,043,584	256,002	457,408	68,196	913,508	119,237	1,879,086	89.50	214,498	128,758	—8,231	—499.725
Colorado & Southern	June	1,099	903,754	173,726	1,156,706	219,708	246,092	12,936	389,936	44,788	923,342	79.80	233,364	165,203	116,824	—96,100
	6 mos.	1,099	4,737,312	873,994	6,059,966	781,325	1,379,419	77,666	2,270,902	268,508	4,820,475	79.50	1,239,491	839,691	681,332	756,047
Ft. Worth & Denver City	June	456	523,855	194,406	784,649	58,217	135,163	13,499	219,280	35,319	467,927	59.60	316,722	275,906	273,372	310,932
	6 mos.	456	3,081,848	1,001,902	4,362,143	386,674	824,445	70,261	1,428,467	218,770	2,951,609	67.60	1,410,534	1,173,344	1,189,590	1,397,445
Wichita Valley	June	256	57,866	23,742	89,779	20,418	5,617	25	38,867	1,412	66,296	73.80	23,483	17,963	6,809	24,839
	6 mos.	256	401,828	126,499	571,445	127,816	47,238	279	248,471	9,053	429,823	75.20	141,622	107,055	48,615	103,402
Columbus & Greenville	June	167	94,551	25,953	126,183	26,496	17,547	3,327	46,568	8,676	102,614	81.30	23,569	18,089	7,432	—68,338
	6 mos.	215	513,066	162,564	714,658	162,698	81,690	20,179	282,653	50,892	598,067	83.70	116,591	88,621	17,057	—337,524
Delaware & Hudson	June	887	1,733,777	277,411	2,296,018	520,587	640,566	45,664	1,069,692	149,383	2,477,438	107.90	—181,420	—270,405	—302,080	1,062,854
	6 mos.	887	15,440,422	1,612,712	18,866,430	2,883,721	4,912,292	262,296	7,628,989	887,572	16,896,701	89.60	1,969,729	1,439,913	1,464,153	2,679,041
Dela., Lackawanna & Western	June	994	3,534,763	1,197,918	5,501,267	900,196	1,094,256	119,772	2,503,623	160,974	4,833,534	87.90	667,733	340,706	411,745	1,395,173
	6 mos.	994	25,074,206	6,434,184	35.882,808	3,933,888	7,630,283	668,991	15,543,052	959,395	28,945,547	80.70	6,937,261	4,374,760	4,726,070	4,662,496
Denver & Rio Grande Western	June	2,593	1,948,638	555,995	2,737,227	431,234	634,793	54,706	840,751	84,986	2,117,624	77.40	619,603	455,853	482.302	—638,058
	6 mos.	2,593	10,923,931	2,410,561	14,456,211	2,061,533	3,104,899	276,875	4,890,777	500,735	11,089,374	76.70	3,366,837	2,427,149	2,653,151	1,131.102
Denver & Salt Lake	June	255	22,731	13,597	41,963	52,509	14,292	1,019	15.079	5,663	88,562	211.00	—46.599	—55.599	—52,824	57.840
	6 mos.	255	428,068	84,569	555,823	213.056	152,778	5,719	212,657	36,483	620,693	111.70	—64,870	—118,880	—98.220	—187.982
Detroit & Mackinac	June	385	141,738	29,033	185.535	29,460	56,104	3,205	57,879	5,350	151,794	81.80	33,741	23.506	22,243	10,073
	6mos.	385	585,425	165,493	815,311	154,518	306,706	13,775	344.606	33,070	852,159	104.50	—36,848	—100.422	—109.340	—50,627
Detroit & Toledo Shore Line	June	61	306,217	.....	310,025	33.852	20,848	1,658	66,876	6,100	129,334	41.70	180,691	166,672	112,092	30.540
	6 mos.	61	1,793,092	.....	1,809,131	174,577	124,925	12,491	485,704	43,066	840,763	46.50	968,368	884,308	500,271	87.958
Detroit, Toledo & Ironton	June	454	882,956	9,568	904.632	153,081	208,819	4,756	262,478	20,002	648,737	71.70	255.895	253.539	123,409	125.977
	6 mos.	454	4,358,160	57,102	4,477,923	607,996	934,606	34,027	1,466,430	109,878	3,152,518	70.40	1,325,405	1,249,921	705,518	190,082
Duluth & Iron Range	June	281	1,220,081	14,080	1,317,150	148,123	116,771	1,170	233,739	19,288	519.672	39.50	797,478	709.706	712,391	226,708
	6 mos.	281	1,894.026	92,992	2.176,549	471.247	552,260	6,808	790,334	100,920	1,922,177	88.30	254,372	92,592	103,988	—507,624
Duluth, Missabe & Northern	June	307	2,463,601	36,568	2,679,074	251,490	144,561	2,892	404,119	20,551	825,370	30.80	1,853,704	1,652,902	1,644,808	969,899
	6 mos.	306	3,326,817	232,536	3,844,734	886,505	804,423	18,443	1,204,653	118,932	3,043,263	79.20	801,471	201,446	185,778	—71,915
Duluth, South Shore & Atlantic	June	591	300,163	92,370	441,665	87,163	69,073	7.005	185,444	11,374	366,650	83.00	75,105	42,105	41,224	—103,808
	6 mos.	591	1,298,384	479,638	1,964,781	368,906	405,439	39,614	1,103,475	69,307	2,017,913	102.70	—53,132	—239,402	—258,772	—504,891
Duluth, Winnipeg & Pacific	June	178	170,447	19,047	194,909	32,551	38,648	4,896	65,980	5,432	147,507	75.70	47,402	37,464	35,077	—36,887
	6 mos.	178	823,794	115,045	972,664	158,790	237,290	28,120	433,854	33,326	891,356	91.60	81,308	27,067	13,327	27,150
Elgin, Joliet & Eastern	June	459	1,501,342	8	1,731,845	168,857	415,241	11,310	539,075	37,030	1,171,303	67.60	560,542	468,155	339,745	193,884
	6 mos.	459	9,448,136	22	10,507,235	845,709	2,152,523	72,248	3,101,133	206,088	6,376,896	60.70	4,130,339	3,607,179	2,877,166	1,324,816
El Paso & Southwestern	June	1,139	825,042	181,796	1,066,040	184,848	170,083	30,476	285,761	45,410	724,642	68.00	341,398	245,410	176,336	281.181
	6 mos.	1,139	3,884,899	973,043	5,209,396	935,736	878,114	167,657	1,427,791	247,281	3,702,312	71.10	1,507,084	930,583	740,193	460,130
Erie	June	2,039	5,154,572	1,128,391	6,911,866	935,419	2,281,746	128,322	3,204,101	276,820	6,871,558	99.40	40,308	—253,428	—114,050	534,481
	6 mos.	2,039	34,678,302	6,249,744	44,435,306	4,593,439	12,705,939	807,043	19,570,046	1,703,291	39,629,390	89.20	4,805,916	3,193,540	3,999,908	2,488,876
Chicago & Erie	June	269	773,146	66,355	903,500	102,552	157,449	17,703	381,213	33,089	692,507	71.60	210,993	155,986	—121,815	—443,022
	6 mos.	269	4,816,539	312,048	5,492,774	571,435	814,932	117,375	2,405,117	205,545	4,114,795	74.90	1,377,979	1,059,689	—593,097	—2,185,598
New Jersey & New York	June	45	16,817	102,326	123,401	16,293	19,010	1,474	71,549	2,917	111,242	90.10	12,159	9,159	—17,176	—1.256
	6 mos.	45	119,673	581,060	728,748	85,336	107,708	7,969	405,714	20,145	626,871	86.00	101,877	83,655	—67,180	—101,348
N. Y., Susquehanna & Western	June	135	224,705	61,580	324,241	57,076	61,856	3,315	193,403	8,073	323,868	99.90	373	—25,098	—41,797	143,938
	6 mos	135	1,354,459	356,246	1,975,049	262,039	341,869	21,527	1,119,320	57,143	1,802,026	91.20	173,023	21,651	—57,227	—45,866
Florida East Coast	June	764	493,930	199,575	813,138	149,168	193,895	11,983	298,854	25,280	683,525	84.10	129,613	66,866	3,838	—104,859
	6 mos.	764	4,726,520	2,407,921	8,065,238	1,023,904	1,182,210	87,896	2,308,381	158,950	4,838,631	60.00	3,226,607	2,860,698	2,613,188	1,600,082
Ft. Smith & Western	June	249	109,749	22,748	142,073	25,438	21,685	4,733	43,813	6,805	103,404	72.80	38,669	32,820	21,149	—30,780
	6 mos	249	548,978	125,831	730,608	148,097	146,447	29,075	272,625	41,330	642,955	88.00	87,653	52,604	883	—101,871
Galveston Wharf	June	13	.....	.....	98,602	54,068	3,854	989	22,497	3,167	98,675	100.10	—73	—17,119	—17,230	63,491
	6 mos.	13	.....	.....	706,854	345,458	25,589	4,906	170,928	21,868	671,383	95.00	35,471	—68,611	—68,526	453,801
Georgia	June	328	280,800	106,058	421,356	42,671	72,627	18.754	195,920	19,564	349,787	83.00	71,569	64,467	70,585	15,061
	6 mos.	328	1,630,132	555,444	2,367,734	236,910	420,630	116,251	1,150,242	113,848	2,039,158	86.10	328,576	285,400	302,112	—66,509
Georgia & Florida	June	405	118,310	12,028	138,050	18,470	14,373	8,289	52,928	6,403	100,676	72.50	37,374	31,073	21,369	—26,717
	6 mos.	405	549,657	69,637	665,104	102,657	106,108	50,024	265,327	38,439	563,839	84.80	101,267	63,407	19,656	—149,325

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Grand Trunk Western	June	347	$1,408,719	$170,128	$1,683,523	$173,315	$307,148	$22,956	$580,194	$47,671	$1,137,284	67.60	$546,239	$473,058	$234,858	—$32,732
	6 mos.	347	6,020,945	862,381	7,343,633	647,132	1,643,033	161,575	3,280,074	300,836	6,070,072	82.70	1,273,561	885,957	—269,484	—863,320
Atlantic & St. Lawrence	June	166	107,414	31,214	164,862	48,849	25,118	5,258	96,494	9,655	185,885	112.80	—21,023	—37,923	—72,413	—153,508
	6 mos.	166	1,067,904	196,055	1,364,899	238,366	219,822	27,192	782,521	72,285	1,350,683	99.00	14,216	—87,228	—495,087	—603,992
Chic. Det. & Canada Gd. Tr. Jct.	June	59	129,086	10,282	155,448	17,720	16,078	2,622	68,246	3,786	108,441	69.80	47,007	33,684	10,949	11,975
	6 mos.	59	985,338	54,342	1,124,376	82,420	76,724	20,376	396,267	22,258	597,955	53.20	526,421	476,875	366,849	179,751
Det. Gr. Haven & Milwk.	June	189	473,208	43,030	553,815	54,404	54,336	6,802	233,777	16,756	366,492	66.20	187,323	183,618	104,603	—54,489
	6 mos.	189	2,121,739	237,879	2,536,005	245,040	279,691	50,263	1,258,820	101,819	1,937,876	76.40	598,129	559,004	171,941	—567,816
Great Northern	June	8,262	6,921,563	1,390,155	9,242,241	1,590,594	1,694,061	182,964	3,092,327	216,498	6,807,580	73.70	2,434,661	1,731,326	1,830,787	1,187,985
	6 mos.	8,265	31,449,656	6,755,161	42,730,195	6,159,727	9,153,101	833,220	18,021,718	1,284,422	35,780,679	83.70	6,949,516	3,279,703	4,039,579	—1,611,160
Green Bay & Western	June	262	100,566	15,400	125,040	24,431	19,423	2,619	40,021	2,328	88,819	71.00	36,221	28,221	24,929	7,150
	6 mos.	262	532,230	104,386	686,695	125,694	112,185	14,424	253,712	16,239	522,231	76.00	164,464	116,464	90,423	71,795
Gulf Coast Lines	June	....	470,333	153,595	678,499	146,847	129,556	24,406	190,267	32,741	522,193	77.00	156,306	116,806	118,249	84,740
	6 mos.	....	3,864,926	899,151	5,102,678	815,900	833,285	159,459	1,412,210	212,933	3,527,300	69.60	1,575,378	1,349,478	1,243,209	766,718
Gulf & Ship Island	June	307	204,126	38,453	259,108	42,379	37,251	6,162	75,202	11,867	173,171	66.80	85,937	68,246	60,777	2,283
	6 mos.	307	1,126,256	220,203	1,437,784	263,246	223,735	45,106	432,667	69,536	1,036,396	72.10	401,388	294,174	259,843	56,172
Gulf, Mobile & Northern	June	436	366,118	34,042	417,466	60,411	65,745	11,942	142,984	15,360	292,421	70.00	125,045	107,747	86,357	—32,242
	6 mos.	436	1,960,855	207,805	2,259,011	334,412	374,304	81,646	760,034	94,568	1,636,573	72.40	622,438	518,991	432,815	—70,968
Hocking Valley	June	348	936,174	84,533	1,178,018	113,272	230,100	11,184	364,981	32,670	748,211	63.50	429,807	337,629	348,816	137,645
	6 mos.	349	5,329,390	491,145	6,350,410	609,031	1,326,547	71,151	2,113,306	187,365	4,297,045	67.70	2,053,365	1,507,772	1,538,478	—480,365
Illinois Central	June	4,784	9,496,756	1,995,288	12,355,745	1,652,018	3,007,704	185,829	4,283,764	305,712	9,491,232	76.80	2,864,513	1,839,762	1,877,234	1,348,000
	6 mos.	4,784	53,283,351	11,310,309	69,773,121	8,525,161	15,549,688	211,696	4,881,534	352,590	10,828,029	78.60	2,952,692	1,808,905	1,850,271	1,258,739
Illinois Central & Yazoo & Miss Val.	June	6,166	10,532,016	2,290,656	13,780,721	2,026,172	3,298,458	1,271,881	29,172,983	2,165,404	60,706,199	77.30	17,795,541	11,164,993	11,499,994	9,228,237
	6 mos.	6,166	59,667,012	13,097,946	78,501,740	10,558,819	17,259,311	1,116,873	25,497,377	1,866,993	52,842,748	75.70	16,930,373	11,011,775	11,357,080	9,078,964
Yazoo & Miss. Valley	June	1,381	1,035,260	295,368	1,424,976	374,154	290,754	25,867	597,770	46,878	1,336,797	93.80	88,179	—30,854	—26,963	—89,261
	6 mos.	1,381	6,383,661	1,787,637	8,728,619	2,033,658	1,709,623	155,008	3,675,606	298,411	7,863,451	90.10	865,168	153,218	142,914	149,273
International & Gr. Northern	June	1,159	735,864	230,032	1,090,186	148,150	214,516	26,622	451,817	45,918	895,734	82.20	194,452	160,472	127,489	—53,795
	6 mos.	1,159	4,791,933	1,181,254	6,741,669	936,893	1,310,921	158,954	2,933,993	288,117	5,664,698	84.00	1,076,971	873,585	540,442	—423,960
Kans. City, Mexico & Orient	June	272	100,547	12,058	123,182	26,122	29,127	4,900	56,999	5,761	122,909	99.80	273	—8,047	—7,891	—64,551
	6 mos.	272	553,433	62,180	665,313	150,076	174,427	28,064	364,920	39,699	757,186	113.80	—91,873	—141,819	—139,152	—264,610
Kan. City, Mex. & Orient of Tex.	June	465	112,290	14,338	135,325	21,298	37,365	4,991	64,688	6,704	135,047	99.80	278	—5,722	—18,757	—97,992
	6 mos.	465	627,864	65,616	740,236	161,224	236,264	28,177	463,573	39,512	928,750	125.50	—188,514	—224,825	—308,663	—473,210
Kansan City Southern	June	767	1,197,590	181,303	1,518,100	195,884	339,648	36,471	523,653	72,841	1,168,660	77.00	349,440	253,979	214,682	319,859
	6 mos.	767	6,907,531	963,117	8,732,517	1,106,445	1,719,549	220,547	3,175,649	414,151	6,630,710	75.90	2,101,807	1,515,777	1,474,942	2,070,968
Texarkana & Ft. Smith	June	81	151,506	15,522	183,464	14,332	9,528	4,701	48,933	8,469	85,963	46.90	97,501	86,547	71,504	—9,170
	6 mos.	81	806,934	86,303	977,860	112,568	143,329	29,747	295,274	51,296	631,259	64.60	346,601	285,003	189,691	143,549
Kansas City Terminal	June	27	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	—27,710	198,597	185,976
	6 mos.	27	.....	.....	.....	.....	.....	.....	.....	.....	—17	.....	17	—167,451	1,188,682	1,114,068
Kansas, Oklahoma & Gulf	June	314	228,830	11,783	250,799	46,204	31,826	6,715	87,573	10,780	183,215	73.10	67,584	56,869	45,528	—20,525
	6 mos.	314	1,217,984	72,817	1,341,614	260,050	150,139	33,063	485,436	59,261	989,155	73.70	352,459	292,578	227,417	—119,421
Lake Superior & Ishpeming	June	33	148,766	29	177,980	21,790	11,545	217	25,484	2,368	61,404	34.50	116,576	110,869	112,309	—22,514
	6 mos.	33	208,433	472	247,681	117,896	58,297	1,257	75,738	15,629	268,817	108.50	—21,136	—54,273	—52,894	—263,579
Lake Terminal	June	13	.....	.....	84,266	11,440	12,514	.....	41,566	1,754	67,274	79.80	16,992	10,656	17,013	18,173
	6 mos.	13	.....	.....	551,559	58,262	57,712	.....	245,117	9,604	370,695	67.20	180,864	142,845	202,041	13,100
Lehigh & Hudson River	June	96	146,482	3,162	160,126	33,063	26,176	1,403	78,863	7,876	147,336	92.00	12,790	—3,488	—18,444	48,612
	6 mos.	96	1,117,217	22,025	1,200,236	168,662	222,559	8,927	494,793	45,103	939,999	78.30	260,237	180,869	72,058	185,897
Lehigh & New England	June	236	231,326	1,760	240,118	64,743	86,592	5,645	99,197	15,042	271,018	112.90	—30,900	—37,545	—27,228	82,037
	6 mos.	236	1,929,410	11,891	1,987,365	258,770	742,416	47,588	714,984	99,777	1,863,308	93.80	124,057	61,186	135,264	416,680
Lehigh Valley	June	1,334	3,699,145	616,688	4,682,192	578,173	1,440,698	100,680	2,183,693	163,172	4,499,642	96.10	182,550	—8,700	—60,897	694,747
	6 mos.	1,334	25 560,675	3,165,731	30,941,221	3,288,626	8,985,322	624,645	13,945,256	826,466	27,814,520	89.90	3,126,701	1,883,020	1,636,840	—676,347
Los Angeles & Salt Lake	June	1,137	1,094,046	598,745	1,844,979	372,496	341,798	52,023	511,728	44,372	1,374,981	74.50	469,998	359,070	325,189	276,693
	6 mos.	1,141	6,094,506	2,513,354	9,450,004	2,048,635	2,099,440	278,278	3,146,221	255,106	8,089,228	85.60	1,360,776	699,292	450,497	722,795
Louisiana & Arkansas	June	302	279,417	33,154	320,341	52,138	44,405	7,184	86,228	8,183	196,765	61.40	123,576	104,185	100,948	18,090
	6 mos.	302	1,396,061	195,840	1,633,284	308,304	279,453	44,897	513,267	49,739	1,192,224	73.00	441,060	324,762	312,076	108,686
Louisiana Ry. & Nav. Co.	June	343	233,333	30,876	281,851	61,243	67,331	11,700	102,594	11,241	254,024	90.10	27,827	11,477	—16,756	14,452
	6 mos.	343	1,350,034	175,156	1,607,991	381,883	285,861	62,172	664,582	70,497	1,464,244	91.00	143,747	45,494	—99,777	12,799
Louisville & Nashville	June	5,038	9,274,203	1,951,824	11,882,969	1,533,906	2,558,342	202,351	4,037,176	233,533	8,606,893	72.40	3,276,076	2,681,539	2,619,409	—474,769
	6 mos.	5,038	47,748,016	10,569,925	62,050,125	8,811,744	14,812,641	1,255,637	23,325,034	1,402,265	49,855,468	80.30	12,194,657	9,811,924	9,839,446	—2,589,212
Louisville, Henderson & St. L.	June	199	218,025	60,333	297,736	78,161	31,306	6,587	105,485	8,168	229,708	77.20	68,028	59,266	44,405	—9,592
	6 mos.	199	1,096,006	340,434	1,531,388	309,974	241,088	37,317	520,859	50,376	1,159,614	75.70	371,774	319,231	239,628	71,181
Maine Central	June	1,194	1,135,037	416,433	1,699,621	315,197	288,970	15,821	692,057	45,627	1,358,829	79.90	340,792	241,343	253,680	—15,795
	6 mos.	1,194	7,324,475	2,064,465	10,126,725	1,607,671	2,119,203	77,044	4,429,719	281,898	8,521,548	84.10	1,605,177	1,009,307	973,879	—781,671
Midland Valley	June	383	341,962	74,040	434,597	66,815	34,002	5,125	110,337	14,960	231,239	53.20	203,358	186,154	167,184	37,561
	6 mos.	383	1,782,292	408,909	2,281,899	314,770	268,871	28,369	670,932	87,976	1,352,893	59.70	919,006	837,348	784,270	257,936
Minneapolis & St. Louis	June	1,649	1,006,777	150,672	1,252,471	185,634	245,348	24,373	552,495	41,266	1,049,231	85.10	183,240	114,814	64,367	—23,755
	6 mos.	1,649	6,149,229	925,232	7,469,918	1,069,759	1,524,464	146,371	3,512,487	243,467	6,495,005	86.90	974,913	591,595	252,584	—683,653
Minn., St. Paul & S. S. Marie	June	4,383	3,118,196	664,044	4,204,331	672,240	719,491	65,467	1,472,322	112,314	3,053,445	72.60	1,150,886	891,135	844,525	—178,934
	6 mos.	4,383	14,139,398	3,232,320	19,254,928	3,079,531	3,918,646	354,552	9,027,602	626,442	17,036,602	88.50	2,218,326	691,952	510,322	—2,886,602
Mississippi Central	June	258	108,332	14,967	129,211	19,960	38,466	5,294	39,832	6,669	110,221	85.30	18,990	12,687	12,440	—6,728
	6 mos.	260	619,027	92,864	739,741	106,479	212,065	33,397	245,562	41,695	639,199	86.40	100,542	62,870	54,743	—61,416

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues			Maintenance of		Operating expenses				Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
			Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.					
Missouri & North Arkansas	June	354	$59,519	$13,153	$76,963	$6,154	$10,989	$1,301	$38,207	$5,067	$61,718	.80	$15,245	$11,045	$3,171	.....
	6 mos.	248	88,435	18,219	115,262	7,824	23,004	1,875	60,157	8,732	101,592	.80	13,670	6,218	—5,035	.....
Missouri, Kansas & Texas	June	1,670	2,016,343	513,043	2,747,099	311,525	680,775	47,304	711,208	83,534	1,741,645	63.40	1,005,454	807,093	851,755	401,130
	6 mos.	1,670	10,518,582	2,815,498	14,698,965	1,501,801	2,921,853	281,734	4,242,775	660,753	9,550,063	65.00	5,148,902	4,117,157	4,415,589	2,139,934
Mo., Kans. & Texas of Texas	June	1,737	1,167,851	488,640	1,816,892	338,304	304,474	42,271	644,427	73,572	1,399,489	77.00	417,403	364,762	206,070	168,572
	6 mos.	1,737	6,561,085	2,543,273	10,008,850	1,508,121	1,393,193	250,803	3,972,012	479,496	7,624,397	76.20	2,384,453	2,072,846	1,055,156	511,303
Wichita Falls & Northwestern	June	329	71,063	24,072	105,402	44,686	14,444	705	54,308	6,572	120,491	114.30	—15,089	—27,119	—39,887	—57,982
	6 mos.	329	498,694	130,774	683,682	159,313	119,630	5,651	313,639	55,670	651,804	95.30	31,878	—41,259	—135,166	13,742
Missouri Pacific	June	7,342	6,356,595	1,449,861	8,663,036	1,659,935	1,930,964	153,278	3,063,361	273,322	7,117,297	82.20	1,545,739	1,194,057	937,220	258,629
	6 mos.	7,330	36,203,136	8,059,257	48,524,436	8,349,541	10,673,582	913,485	19,448,148	1,592,632	41,136,521	84.80	7,387,915	5,129,170	3,380,248	2,071,520
Mobile & Ohio	June	1,165	1,262,379	144,952	1,486,222	187,621	320,827	46,908	530,082	48,516	1,134,580	76.70	345,642	291,517	230,500	—144,900
	6 mos.	1,165	7,275,381	817,649	8,522,874	1,050,650	1,701,977	273,247	3,267,980	291,165	6,591,928	77.30	1,930,946	1,584,429	1,269,650	252,321
Monongahela	June	106	102,397	23,934	129,932	35,251	32,400	1,968	48,798	7,572	125,989	97.00	3,943	—4,057	—27,619	19,160
	6 mos.	106	1,530,402	174,310	1,730,964	234,903	262,095	8,178	451,301	56,431	1,013,808	58.60	717,156	669,156	441,229	—72,522
Monongahela Connecting	June	7	.....	.....	155,429	22,649	22,195	540	66,799	9,795	121,978	78.48	33,451	31,261	26,878	—9,161
	6 mos.	7	.....	.....	832,985	89,817	132,697	3,214	345,233	46,633	617,594	74.14	215,391	202,320	193,390	—65,821
Montour	June	56	19,682	742	21,802	12,190	17,207	1,156	10,212	6,007	46,772	214.50	—24,970	—27,463	—23,993	33,615
	6 mos.	56	337,714	4,603	348,006	92,675	159,034	5,956	112,836	37,109	407,610	117.10	—59,604	—74,729	—5,464	119,067
Nashville, Chatt. & St. Louis	June	1,258	1,218,714	896,601	1,751,912	316,091	443,878	67,432	657,489	51,748	1,540,332	87.90	211,580	176,239	229,092	115,497
	6 mos.	1,258	7,191,123	2,196,889	10,143,436	1,640,003	2,754,469	421,229	3,954,063	345,670	9,146,095	90.10	997,341	774,639	992,030	—362,262
Nevada Northern	June	165	35,814	6,255	46,078	7,981	1,856	548	9,048	2,139	21,572	46.90	24,506	18,389	21,760	—18,727
	6 mos.	165	137,408	22,893	186,150	52,804	18,362	2,649	44,647	15,751	135,213	72.50	50,937	14,243	33,023	—66,477
Newburgh & South Shore	June	7	.....	.....	178,888	16,419	38,955	.....	69,678	3,530	128,582	71.90	50,306	37,642	31,228	6,428
	6 mos.	7	.....	.....	997,496	57,600	205,650	.....	376,571	21,557	661,378	66.30	336,118	261,694	242,871	11,925
New Orleans Great Northern	June	274	167,622	37,328	213,954	32,498	—8,768	4,579	74,565	9,386	112,749	52.70	101,207	86,141	81,019	—4,119
	6 mos.	274	1,008,633	207,035	1,267,449	200,503	210,539	29,934	402,702	61,238	907,507	71.60	359,942	269,560	229,244	80,629
New York Central	June	6,098	17,380,272	8,498,917	29,462,408	3,786,209	7,155,151	327,262	9,482,895	766,858	21,852,140	74.20	7,610,268	5,765,102	6,008,492	5,517,555
	6 mos.	6,098	97,650,550	41,612,065	158,557,783	18,333,847	39,967,696	1,871,058	56,928,388	4,625,569	123,641,537	78.00	34,916,246	25,002,976	26,198,845	17,293,297
Cincinnati Northern	June	244	295,187	14,227	317,754	64,031	61,333	6,509	100,128	7,035	239,036	75.20	78,718	63,848	43,321	145,784
	6 mos.	244	1,619,745	88,145	1,750,311	337,981	312,306	30,152	568,928	49,453	1,297,323	74.10	452,988	349,942	225,891	288,745
Cleve., Cin., Chic. & St. Louis	June	2,411	5,464,956	1,575,377	7,613,870	1,124,721	1,144,514	136,077	2,523,132	171,942	5,145,920	67.60	2,467,950	1,969,156	1,827,437	751,999
	6 mos.	2,411	30,004,050	7,698,384	40,829,638	4,500,398	7,636,665	658,559	14,928,577	1,018,176	29,931,229	71.10	11,798,409	9,233,841	8,409,775	2,696,203
Indiana Harbor Belt	June	119	.....	.....	822,389	131,730	92,788	4,660	276,331	21,493	527,002	64.10	295,387	256,368	154,097	76,193
	6 mos.	119	.....	.....	4,638,822	558,609	419,336	23,766	1,857,036	116,609	2,975,356	64.10	1,663,466	1,436,365	995,181	—88,600
Kanawha & Michigan	June	176	144,594	42,869	203,839	67,208	149,314	4,306	99,601	10,784	331,211	162.50	—127,372	—153,729	—154,829	53,926
	6 mos.	176	1,214,314	264,473	1,560,542	363,700	619,445	25,763	628,394	65,534	1,702,401	109.10	—141,859	—305,894	—240,637	50,249
Lake Erie & Western	June	718	786,763	34,147	856,905	183,032	317,361	18,378	307,406	29,103	855,118	99.80	1,787	—42,363	—45,147	—86,852
	6 mos.	718	4,199,443	206,286	4,588,921	807,395	1,167,475	108,851	1,789,227	183,588	4,055,940	88.40	532,981	269,540	239,481	—264,336
Michigan Central	June	1,862	4,646,650	1,851,164	7,224,128	780,223	1,113,522	76,424	2,209,427	142,361	4,397,672	60.90	2,826,456	2,283,903	2,186,713	1,459,699
	6 mos.	1,862	25,294,403	8,428,167	37,437,749	3,998,602	8,037,630	535,346	13,169,920	864,146	26,996,863	72.10	10,440,886	8,313,096	7,724,486	4,809,464
Pittsburgh & Lake Erie	June	227	1,728,722	224,260	2,061,173	306,589	720,717	16,764	695,689	63,910	1,805,494	87.60	255,679	173,554	351,726	253,589
	6 mos.	227	10,042,117	1,250,099	11,800,206	1,465,861	5,839,798	115,505	4,039,522	380,695	11,853,032	100.40	—52,826	—534,464	156,328	1,289,314
Toledo & Ohio Central	June	503	305,576	63,222	401,560	121,372	176,256	10,475	214,892	24,957	550,438	137.10	—148,878	—203,909	—193,315	131,316
	6 mos.	503	3,155,343	365,545	3,684,921	745,612	1,182,307	65,063	1,655,772	149,235	3,814,844	103.50	—129,923	—460,083	—411,222	425,349
New York, Chic. & St. Louis	June	523	2,408,000	127,286	2,606,879	272,742	501,004	64,777	842,693	80,263	1,768,778	67.90	838,101	715,597	681,183	343,490
	6 mos.	523	13,326,884	555,310	14,222,570	1,363,934	2,579,822	348,792	5,108,922	483,687	9,916,567	69.70	4,306,003	3,571,304	3,412,248	2,016,933
N. Y., New Haven & Hartford	June	1,986	4,921,915	4,088,591	10,249,837	1,766,691	2,186,526	59,997	4,154,204	269,398	8,576,409	83.70	1,673,428	1,291,163	851,795	—83,396
	6 mos.	1,986	28,411,466	22,913,558	57,847,727	7,763,103	11,481,835	327,599	23,891,454	1,730,761	46,071,316	79.60	11,776,411	9,457,009	6,895,556	—4,736,743
Central New England	June	295	413,898	16,819	458,678	128,425	93,282	4,572	195,559	10,375	431,462	94.10	27,216	4,962	—29,583	125,404
	6 mos.	295	3,222,243	116,031	3,511,250	651,675	522,639	25,467	1,210,519	69,754	2,479,130	70.60	1,032,120	896,171	613,984	532,969
New York, Ontario & Western	June	569	395,548	305,266	888,365	187,023	162,270	15,278	417,749	29,840	812,160	91.40	76,205	38,073	—7,647	164,075
	6 mos.	569	3,588,683	1,035,962	5,591,268	761,086	1,082,156	88,878	2,742,166	179,546	4,853,832	86.80	737,436	508,443	240,019	197,602
Norfolk & Western	June	2,237	8,398,611	790,814	9,473,091	1,061,738	1,940,910	87,425	2,344,382	157,038	5,612,954	59.30	3,869,137	3,259,622	3,403,803	1,247,706
	6 mos.	2,237	40,307,257	4,120,620	46,011,351	5,623,664	10,452,605	459,655	13,375,281	902,581	30,885,297	67.10	15,126,054	12,271,486	13,574,542	4,367,386
Norfolk Southern	June	930	583,780	131,358	752,968	105,231	118,114	22,519	291,464	29,135	566,823	75.30	186,145	153,732	131,051	72,943
	6 mos.	930	3,300,453	673,927	4,200,225	611,810	686,158	132,044	1,766,197	182,317	3,380,876	80.50	819,349	638,568	471,505	162,190
Northern Pacific	June	6,631	5,872,074	1,647,617	8,300,557	1,535,565	1,944,913	137,554	2,731,257	213,401	6,657,239	80.20	1,643,318	1,049,293	1,581,454	—624,329
	6 mos.	6,650	30,614,820	7,396,909	41,922,104	6,201,903	11,045,150	828,728	16,802,336	1,318,766	36,708,898	87.60	5,213,206	853,252	2,718,239	—1,835,665
Northwestern Pacific	June	496	369,195	268,296	719,158	127,157	59,498	6,945	255,965	14,361	465,635	64.70	253,523	207,992	197,530	241,783
	6 mos.	504	1,869,776	1,215,793	3,557,385	683,262	427,298	41,726	1,463,331	87,290	2,711,684	76.20	845,701	565,201	488,973	440,324
Pennsylvania	June	7,314	26,834,476	10,003,406	40,260,248	5,866,017	10,049,663	460,508	14,425,347	1,087,424	32,561,050	80.90	7,699,198	5,483,428	4,836,653	4,722,113
	6 mos.	7,314	163,181,214	57,320,544	240,161,064	28,453,756	61,510,775	2,637,076	87,751,681	6,602,250	190,932,999	79.50	49,228,065	39,617,553	36,959,992	12,907,508
Balti., Chesa. & Atlantic	June	87	99,837	40,411	148,510	16,102	21,519	2,887	78,306	4,369	123,183	82.90	25,327	20,657	21,921	1,459
	6 mos.	87	472,474	167,337	667,302	77,994	233,371	10,256	406,547	22,353	750,526	112.50	—83,224	—94,072	—91,379	—96,051
Cumberland Valley & Mont	June	33	50,620	5,656	60,211	12,003	16,866	1,095	30,919	2,955	63,838	106.00	—3,627	—11,166	—15,883	71,227
	6 mos.	33	397,214	35,087	453,318	54,305	107,154	5,382	183,015	15,562	365,418	80.60	87,900	54,987	27,225	210,884
Cin., Lebanon & Northern	June	76	85,163	9,343	100,082	21,390	17,293	1,944	52,753	2,709	96,089	96.00	3,993	—4,417	—363	—13,951
	6 mos.	76	420,763	46,847	519,111	87,331	96,492	10,510	329,537	13,825	537,695	103.60	—18,584	—59,577	—49,509	—159,179
Grand Rapids & Ind	June	575	484,074	164,669	712,602	135,780	194,045	14,659	370,232	23,989	740,080	103.90	—27,478	—59,395	—79,560	—91,583
	6 mos.	575	2,898,331	893,881	4,125,809	617,306	1,159,522	83,141	2,179,536	145,287	4,187,930	101.50	—62,121	—216,529	—321,538	—215,302

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Maintenance of: Way and structures.	Equipment.	Operating expenses: Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Long Island	June	398	$713,380	$1,947,357	$2,917,091	$275,707	$421,405	$28,330	$1,113,889	$54,952	$1,912,348	65.60	$1,004,743	$799,298	$745,797	$430,485
	6 mos.	398	4,325,362	8,372,332	13,964,429	1,613,558	2,500,540	98,179	6,312,067	345,683	10,977,315	78.60	2,987,114	2,384,520	1,981,023	—70,439
Md., Dela. & Virginia	June	82	74,388	29,510	107,654	8,492	34,653	1,960	68,696	2,866	116,667	108.30	—9,013	—11,049	—13,762	—24,809
	6 mos.	82	353,297	111,386	483,500	52,046	171,737	6,950	339,471	14,607	584,811	121.00	—101,311	—106,365	—113,972	—74,272
N. Y., Phila. & Norfolk	June	122	516,503	83,558	659,842	63,215	172,290	7,225	342,418	13,732	608,002	92.10	51,840	25,295	—11,503	—56,172
	6 mos.	122	2,757,725	439,084	3,483,385	340,737	936,939	45,401	1,773,802	82,901	3,231,458	92.80	251,927	160,005	53,430	—509,026
Pitts., Cin., Chicago & St. L.	June	2,435	6,362,693	1,737,420	8,910,749	1,067,732	2,375,313	117,182	3,250,329	199,661	7,085,123	79.50	1,825,626	1,438,533	1,014,883	167,063
	6 mos.	2,435	33,299,585	9,377,421	47,521,417	4,684,385	12,861,905	672,469	18,993,390	1,223,228	38,831,885	81.70	8,689,532	6,748,664	5,368,072	—2,349,421
West Jersey & Seashore	June	359	391,881	607,568	1,090,194	169,968	217,586	17,089	506,082	26,155	949,677	87.10	140,517	48,427	30,304	24,729
	6 mos.	359	2,227,255	3,016,014	5,725,940	926,962	1,203,685	89,549	2,778,525	156,250	5,223,128	91.20	502,812	311,479	214,179	—465,990
Peoria & Pekin Union	June	19	6,477	1,396	129,845	41,154	11,379	506	55,356	9,110	117,505	90.50	12,340	—2,660	20,150	20,337
	6 mos.	19	74,591	22,818	891,054	165,606	102,248	1,085	367,017	54,827	690,783	77.50	200,271	113,771	251,718	34,084
Pere Marquette	June	2,212	2,472,121	484,077	3,304,993	450,200	619,311	50,710	1,121,172	99,789	2,345,541	71.00	959,452	805,719	709,448	497,520
	6 mos.	2,220	14,261,309	2,328,230	18,207,976	2,058,058	3,738,674	312,499	7,127,136	631,219	13,915,012	76.40	4,292,964	3,411,258	2,626,684	1,564,466
Philadelphia & Reading	June	1,127	4,506,342	793,732	5,673,491	767,101	1,774,394	69,331	2,299,160	152,069	5,074,392	89.40	599,099	382,957	123,507	829,217
	6 mos.	1,127	31,557,059	4,746,895	38,260,119	4,511,473	10,354,382	366,048	13,914,136	890,097	30,062,134	78.60	8,197,985	6,970,448	5,582,788	2,698,260
Atlantic City	June	176	134,036	323,357	467,594	81,101	42,650	10,798	228,332	9,125	372,012	79.60	95,582	76,333	28,663	42,600
	6 mos.	176	717,160	1,107,834	1,874,969	351,910	175,137	30,360	1,131,087	29,780	1,717,150	91.60	157,819	36,649	—132,483	—323,215
Perkiomen	June	41	110,331	7,813	122,108	7,846	4,432	112	47,450	902	60,781	49.80	61,327	56,455	50,858	35,552
	6 mos.	41	519,727	44,342	585,458	42,313	25,329	649	264,826	5,352	338,701	57.90	246,757	214,377	180,373	282,244
Port Reading	June	21	56,448	.....	92,507	24,588	21,084	229	38,228	1,496	85,625	92.60	6,882	—7,871	—41,010	—14,308
	6 mos.	21	632,531	.....	998,840	118,814	47,678	1,374	333,280	10,440	511,584	51.20	487,256	397,956	67,251	122,381
Pittsburg & Shawmut	June	102	50,394	3,451	55,345	23,122	65,406	1,751	22,030	6,456	118,765	214.60	—63,420	—63,546	—54,397	—12,731
	6 mos.	102	467,709	33,689	510,067	156,592	227,929	9,070	173,116	42,145	608,852	110.40	—98,785	—99,532	—36,865	67,535
Pittsburg & West Virginia	June	85	192,852	7,639	228,343	35,001	43,579	3,927	50,141	13,944	154,917	67.80	73,426	44,770	66,153	119,724
	6 mos.	85	1,153,191	54,137	1,391,143	163,933	401,940	21,094	330,113	94,630	1,063,120	76.40	328,023	172,112	378,770	64,106
Pittsburg, Shawmut & Northern	June	210	63,223	4,905	72,413	26,184	33,209	2,338	30,753	5,636	98,129	135.50	—25,716	—27,916	—31,194	—28,324
	6 mos.	210	464,630	40,649	523,890	106,723	255,143	10,168	233,501	42,245	647,809	121.70	—123,919	—137,253	—139,605	—125,434
Quincy, Omaha & Kans. City	June	252	64,443	24,258	98,873	34,448	15,716	713	35,865	2,511	89,128	90.10	9,745	5,787	833	—13,473
	6 mos.	252	337,720	142,094	530,687	181,537	97,767	4,776	250,911	14,350	548,212	103.30	—17,525	—41,131	—68,657	—96,612
Richmond, Fred. & Potomac	June	117	539,580	253,553	960,332	152,126	125,021	7,587	300,170	25,406	636,086	66.20	324,246	270,899	231,426	40,820
	6 mos.	117	2,729,932	1,787,891	5,407,635	610,474	748,055	48,031	1,894,045	157,556	3,585,231	66.30	1,822,404	1,527,521	1,210,844	485,307
Rutland	June	415	245,259	113,249	469,047	106,028	94,302	8,431	200,256	14,454	425,151	90.60	43,896	20,248	19,707	22,948
	6 mos.	415	1,528,612	676,318	2,740,961	543,722	554,206	49,683	1,273,890	79,476	2,509,559	91.60	231,402	105,562	129,340	—271
St. Louis-San Francisco	June	4,760	5,338,466	1,706,758	7,566,589	1,256,886	1,327,861	92,578	2,451,792	178,165	5,267,290	69.60	2,299,299	1,924,644	1,861,468	1,355,560
	6 mos.	4,760	27,794,110	8,766,117	39,420,419	5,791,594	7,502,577	504,597	14,200,124	1,127,316	28,982,863	73.50	10,437,556	8,413,501	8,468,956	7,870,357
Ft. Worth & Rio Grande	June	235	61,623	31,737	104,424	55,772	21,221	2,960	48,009	6,247	134,200	128.50	—29,776	—33,382	—38,757	—55,725
	6 mos.	235	364,869	167,916	595,052	274,495	132,099	16,568	301,342	34,565	756,850	127.20	—161,798	—184,825	—215,450	—229,401
St. Louis, San Fran. & Tex	June	134	119,697	15,535	141,489	30,473	21,055	4,097	72,586	7,097	135,315	95.60	6,174	4,057	—16,270	—9,061
	6 mos.	134	653,215	88,609	780,826	186,549	144,244	22,238	350,848	41,088	744,122	95.30	36,704	24,722	—99,525	—360,532
St. Louis Southwestern	June	968	1,248,388	135,724	1,449,634	182,054	208,596	40,846	378,557	56,352	873,177	60.20	576,457	492,692	472,754	432,600
	6 mos.	968	7,234,037	765,313	8,351,238	1,230,614	1,302,782	258,394	2,193,726	322,876	5,340,433	63.90	3,010,805	2,635,403	2,429,093	2,238,651
St. Louis Southw. of Tex	June	807	500,684	91,197	634,760	188,733	140,758	21,055	305,389	31,373	685,968	108.10	—51,208	—75,495	—65,973	—114,555
	6 mos.	807	2,707,199	510,938	3,438,201	1,143,223	964,745	119,228	1,806,656	184,092	4,212,447	122.50	—774,246	—918,714	—879,085	—769,808
San Antonio & Aransas Pass	June	739	309,210	72,866	416,187	97,056	105,311	9,548	186,403	33,690	431,393	103.60	—15,206	—29,423	—38,484	36,571
	6 mos.	739	1,937,008	373,090	2,483,789	564,483	689,682	56,985	1,207,037	161,134	2,675,581	107.70	—191,792	—276,383	—352,391	—361,473
San Antonio, Uvalde & Gulf	June	317	42,814	17,918	69,044	13,665	13,195	2,800	31,072	5,865	66,574	96.40	2,470	—8,523	10,030	—18,553
	6 mos.	317	354,371	99,883	514,482	84,734	73,267	17,007	205,522	38,192	417,483	81.10	96,999	79,074	15,364	36,543
Seaboard Air Line	June	3,563	2,619,774	627,017	3,600,199	405,422	592,187	112,410	1,486,841	150,273	2,770,470	77.00	829,729	654,088	449,610	—209,543
	6 mos.	3,563	15,681,298	4,527,066	22,426,507	2,451,079	3,833,941	735,244	9,593,219	915,114	17,728,824	79.00	4,697,683	3,665,033	2,031,037	642,783
Southern	June	6,971	7,868,620	2,699,663	11,385,785	1,563,436	1,869,575	228,173	4,048,345	321,086	8,111,808	71.20	3,273,977	2,777,481	2,420,736	1,098,958
	6 mos.	6,971	43,333,820	14,117,154	61,995,456	8,821,556	11,362,074	1,266,410	24,416,749	1,946,216	48,279,092	77.90	13,716,364	10,912,759	8,877,426	2,143,948
Alabama Grt. Southern	June	318	634,936	189,739	861,027	104,095	164,835	18,022	303,491	25,321	621,870	72.20	239,157	185,619	187,440	114,354
	6 mos.	318	3,624,600	861,886	4,711,467	512,942	901,373	107,408	1,771,012	149,718	3,475,511	73.80	1,235,956	977,227	990,614	244,666
Cin., N. O. & Tex. Pacific	June	338	1,451,109	296,039	1,821,510	173,907	470,527	30,487	619,019	44,248	1,345,663	73.90	475,847	396,394	294,908	266,656
	6 mos.	338	7,145,427	1,589,967	9,119,251	959,435	2,384,577	166,134	3,143,304	255,820	6,968,598	76.40	2,150,653	1,720,292	1,586,004	776,913
Georgia, Southern & Fla	June	402	288,489	91,201	406,801	65,772	58,663	8,873	164,298	11,887	312,243	76.80	94,558	74,481	49,604	—90,390
	6 mos.	402	1,599,685	599,543	2,371,004	382,061	409,163	53,116	1,016,798	74,127	1,952,706	82.40	418,298	314,876	187,240	—506,216
New Orleans & Northeastern	June	207	419,797	89,718	558,572	72,781	117,702	10,810	229,298	19,336	452,522	81.00	106,050	69,344	71,290	—26,519
	6 mos.	207	2,354,232	465,199	3,120,824	419,597	639,213	65,960	1,370,874	105,510	2,622,348	84.00	498,476	265,060	233,959	—164,634
Northern Alabama	June	110	109,279	10,024	122,001	20,222	7,924	1,434	49,151	2,810	81,541	66.80	40,460	36,392	6,106	—1,207
	6 mos.	110	548,184	66,044	628,932	101,908	34,062	8,026	240,912	18,370	403,273	64.10	225,659	201,297	70,098	—54,518

REVENUES AND EXPENSES OF RAILWAYS

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF JUNE AND SIX MONTHS OF CALENDAR YEAR 1922—CONTINUED

Name of road.		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operations.	Operating income (or loss).	Net after rentals.	Net after rentals 1921.
Southern Pacific	June	7,118	$10,701,013	$4,433,888	$16,740,374	$1,939,803	$2,568,509	$220,096	$5,319,763	$441,661	$10,826,192	64.70	$5,914,182	$4,555,017	$4,305,135	$3,127,715
	6 mos.	7,117	53,662,358	21,431,641	83,205,310	11,616,942	15,062,984	1,367,868	29,010,805	2,556,918	61,230,534	73.60	21,974,776	13,848,888	13,472,784	13,347,209
Arizona Eastern	June	382	254,921	32,399	281,019	33,013	26,125	3,446	75,127	15,984	154,583	55.00	126,436	102,923	84,803	—36,948
	6 mos.	382	1,271,483	173,335	1,494,068	173,219	165,759	18,223	425,267	112,642	899,232	60.20	594,836	451,911	369,103	17,937
Atlantic S. S. Lines	June	...	801,617	41,681	883,427	11,121	190,898	18,971	498,480	27,064	746,534	84.50	136,893	124,472	125,522	21,748
	6 mos.	...	5,052,452	302,797	5,635,528	72,249	982,877	113,059	3,211,126	156,887	4,536,198	80.50	1,099,330	1,024,077	1,026,132	209,618
Galv., Harris. & S. Antonio	June	1,379	1,294,096	434,235	1,860,437	334,547	361,586	37,803	669,858	70,767	1,494,608	80.30	365,829	314,255	288,936	177,724
	6 mos.	1,379	7,653,698	2,233,735	10,506,166	1,961,514	2,128,759	224,382	4,167,763	434,618	8,965,821	85.30	1,540,345	1,231,349	952,210	830,195
Houston & Texas Central	June	923	710,991	294,075	1,094,774	233,739	225,495	25,039	387,250	42,376	909,343	83.10	185,431	143,332	127,585	69,789
	6 mos.	923	4,711,594	1,734,384	6,904,226	1,277,109	1,362,064	142,265	2,556,060	250,650	5,575,209	80.80	1,329,017	1,065,820	863,886	—36,074
Houston, East & West Texas	June	191	226,160	45,004	281,942	52,444	53,996	3,677	105,108	7,918	221,471	78.55	60,471	56,093	38,015	40,164
	6 mos.	191	1,109,336	235,244	1,413,013	295,921	296,085	20,248	592,007	49,080	1,246,306	88.20	166,707	130,386	52,153	—24,860
Louisiana Western	June	207	188,539	96,711	310,701	70,158	57,546	8,767	90,686	16,422	247,985	79.80	62,716	65,373	69,229	7,093
	6 mos.	207	1,445,374	517,544	2,108,193	397,322	401,143	53,498	622,437	107,482	1,606,068	76.20	502,125	367,813	364,370	213,588
Morgan's L. & T. R. R. & S. S. Co.	June	400	409,219	168,234	627,443	140,597	131,526	15,249	254,836	31,950	579,730	92.40	47,713	1,198	—14,945	—209,699
	6 mos.	400	2,637,059	896,552	3,850,216	844,064	857,307	98,508	1,589,788	202,829	3,620,924	94.00	229,292	—51,977	—144,048	—517,239
Tex. & New Orleans	June	507	474,309	165,106	686,184	153,059	178,897	10,607	321,469	24,238	693,787	101.10	—7,603	—29,876	—54,235	17,918
	6 mos.	507	3,161,431	922,970	4,346,660	856,209	1,083,411	65,734	1,659,771	156,280	3,853,002	88.60	493,658	355,116	173,365	—546,760
Spokane International	June	165	79,312	12,465	96,547	14,866	7,218	3,106	32,103	6,724	63,815	66.10	32,732	27,255	19,301	5,382
	6 mos.	165	450,530	65,409	541,334	85,217	46,584	17,698	207,471	36,334	397,998	73.50	143,336	110,363	68,793	95,399
Spokane, Portland & Seattle	June	549	420,339	171,326	646,532	23,587	93,132	12,598	217,368	20,172	377,236	58.40	269,296	185,124	198,222	120,447
	6 mos.	549	2,308,665	787,601	3,390,108	312,009	519,822	58,887	1,163,710	119,550	2,221,967	65.50	1,168,141	662,835	616,869	420,814
Tennessee Central	June	292	163,367	43,364	219,064	44,533	32,344	6,622	89,643	16,585	189,707	86.60	29,357	25,275	4,784	—10,836
	6 mos.	292	867,936	240,844	1,193,731	205,758	201,213	31,932	622,720	71,287	1,132,851	94.90	60,880	35,173	—73,938	—249,432
Term. R. R. Assn. of St. Louis	June	37	.....	.....	383,404	88,466	37,281	1,040	116,035	6,441	252,646	65.90	130,758	70,537	191,540	123,734
	6 mos.	37	.....	.....	2,283,855	449,154	219,395	6,644	739,547	40,527	1,476,202	64.60	807,653	485,148	1,183,716	920,743
East St. L. Connecting	June	1	.....	.....	173,377	13,794	7,840	294	55,901	2,370	80,199	46.30	93,178	85,123	76,322	15,971
	6 mos.	1	.....	.....	1,011,166	78,171	43,470	1,940	341,545	16,595	481,721	47.60	529,445	456,875	406,703	132,283
St. L. Merchants' Bridge Term.	June	9	.....	.....	278,309	43,241	31,841	918	132,886	4,056	212,942	71.50	65,367	47,737	67,347	40,830
	6 mos.	9	.....	.....	1,781,546	240,149	154,478	5,917	850,985	27,907	1,279,436	71.80	502,110	385,902	511,075	223,042
St. Louis Transfer	June	6	.....	.....	62,455	10,954	4,954	170	33,188	1,537	50,803	81.30	11,652	10,771	1,792	30,783
	6 mos.	6	.....	.....	370,574	59,308	25,740	1,123	197,676	10,326	294,173	79.40	76,401	73,834	24,967	208,458
Texas & Pacific	June	1,952	1,689,712	664,301	2,566,841	464,154	446,156	48,168	871,493	136,650	1,989,928	77.50	576,913	476,566	401,847	276,787
	6 mos.	1,952	9,798,865	3,442,151	14,370,805	2,682,369	2,885,252	281,217	5,553,714	581,369	12,089,684	84.10	2,281,121	1,604,230	1,180,306	819,278
Toledo, Peoria & Western	June	247	94,266	38,769	145,712	26,342	38,695	2,975	69,510	7,726	145,248	99.70	464	—10,536	—15,012	—60,583
	6 mos.	247	457,883	272,048	791,224	138,867	212,642	17,237	405,309	46,773	820,756	103.70	—29,532	—95,932	—120,078	—298,301
Toledo, St. Louis & Western	June	454	843,574	29,198	917,607	112,857	144,831	20,983	282,324	26,343	587,338	64.00	330,269	282,269	230,041	156,572
	6 mos.	454	4,521,342	154,325	4,906,257	603,538	821,802	129,433	1,583,344	156,078	3,294,195	67.10	1,612,062	1,328,991	1,185,551	381,106
Trinity & Brazos Valley	June	368	113,756	19,427	139,785	30,533	30,334	3,254	63,002	11,110	137,507	98.40	2,278	—4,733	—25,290	13,557
	6 mos.	368	1,396,752	124,356	1,580,058	381,700	337,619	19,539	587,480	71,236	1,393,564	88.20	186,494	144,359	—147,473	—98,611
Ulster & Delaware	June	128	67,868	46,526	154,490	27,549	22,990	3,903	74,353	7,952	137,270	88.90	17,220	11,217	6,445	—12,181
	6 mos.	128	357,511	157,882	713,527	115,991	128,488	14,787	364,589	46,795	674,150	94.50	39,377	3,111	—19,903	—133,591
Union of Penn	June	45	.....	.....	1,192,118	114,428	189,590	464	408,423	7,290	720,195	60.40	471,923	458,093	503,097	330,624
	6 mos.	45	.....	.....	5,071,267	418,139	1,093,062	1,495	2,090,906	42,122	3,645,725	71.90	1,452,542	1,345,052	1,679,158	847,499
Union Pacific	June	3,707	5,713,399	1,776,495	8,401,925	1,167,960	1,829,234	171,684	2,184,872	312,090	5,894,884	70.20	2,507,041	1,915,307	1,934,588	2,308,510
	6 mos.	3,679	32,875,155	8,168,505	45,402,183	4,943,214	10,187,973	827,322	13,499,284	1,872,231	32,265,252	71.10	13,136,931	9,706,066	9,552,999	10,153,685
Oregon Short Line	June	2,359	2,011,856	545,448	2,804,310	615,890	575,357	53,512	826,750	119,408	2,267,178	80.80	537,132	258,044	251,106	223,477
	6 mos.	2,359	12,568,091	2,567,924	16,380,589	2,507,623	3,394,394	276,717	5,215,988	719,766	12,452,890	76.00	3,927,699	2,272,919	2,157,448	980,804
Oreg. Wash. R. R. & Nav	June	2,237	1,533,289	583,560	2,343,050	671,413	447,264	65,671	987,900	125,176	2,329,955	99.40	13,095	—168,170	—245,210	109,324
	6 mos.	2,224	8,893,255	2,649,831	12,698,727	2,783,021	2,503,904	357,222	5,755,334	749,594	12,315,223	97.00	383,504	—704,064	—1,162,794	—742,507
St. Joseph & Gr. Island	June	258	190,069	25,594	234,919	66,623	54,303	2,322	108,429	11,770	243,447	103.60	—8,528	—28,146	—39,708	—43,004
	6 mos.	258	1,262,341	152,526	1,505,620	258,330	294,100	15,143	665,195	72,170	1,304,938	86.70	200,682	92,237	39,115	—71,258
Utah	June	102	157,653	456	159,033	33,206	34,528	350	29,743	5,965	103,792	65.26	55,241	50,083	34,489	—43,203
	6 mos.	102	745,909	4,607	760,531	108,142	215,855	2,161	171,653	28,989	526,800	69.27	233,731	194,876	123,989	—30,340
Virginian	June	526	1,877,724	68,815	2,069,254	207,745	423,428	10,756	397,614	34,012	1,072,504	51.80	996,750	873,466	884,215	792,512
	6 mos.	526	9,451,121	377,140	10,485,198	1,112,829	2,503,565	69,441	2,203,008	187,044	6,074,409	57.90	4,410,789	3,758,883	3,833,222	2,917,300
Wabash	June	2,472	3,925,185	917,661	5,362,371	748,049	1,016,121	116,671	2,048,146	151,932	4,111,876	76.70	1,250,495	1,056,565	800,946	3,988
	6 mos.	2,472	22,214,756	4,427,892	28,630,584	3,937,895	5,801,615	696,359	11,970,260	917,187	23,469,108	82.00	5,161,476	4,016,546	2,430,437	890,177
Western Maryland	June	804	1,097,996	78,375	1,271,571	159,907	259,817	41,011	445,686	46,488	972,895	76.50	298,676	258,676	257,567	249,904
	6 mos.	804	7,200,274	436,736	8,244,039	1,053,640	1,664,843	195,328	2,906,174	272,353	6,216,989	75.40	2,027,050	1,757,050	1,562,474	1,464,493
Western Pacific	June	1,045	643,956	339,793	1,064,742	202,613	165,099	33,206	347,297	36,623	812,956	76.40	251,786	165,186	179,477	33,937
	6 mos.	1,043	3,670,565	1,048,436	5,090,241	895,361	976,018	191,990	2,047,301	230,035	4,455,291	87.50	634,950	116,223	284,711	348,603
Wheeling & Lake Erie	June	511	1,151,385	71,727	1,346,652	210,387	264,123	15,271	411,208	32,782	937,308	69.60	409,344	271,303	267,284	359,301
	6 mos.	511	5,933,876	417,598	6,822,930	997,953	1,397,562	103,665	2,373,877	204,949	5,098,936	74.70	1,723,994	1,036,892	932,141	450,223

Railroads Handle Traffic Efficiently During Chicago Car Strike

During the Chicago street car and elevated railroad strike which began on August 1, and lasted until August 6, the railroads handled a greatly increased traffic in their suburban zones with little delay or congestion. In most cases the extra train service was provided by the abandonment of the regular suburban schedules and the substitution of shuttle service under which trains were run as fast as the traffic warranted. Some idea of the pressure placed on the larger suburban carriers may be gained from the following figures: The Chicago & North Western carries approximately 60,000 suburban passengers on a normal business day and the number of trains necessary to handle this business is 166. On August 1, the first day of the strike, the number of passengers carried by this road was 109,810, and the trains operated, 225. On August 2, the above number was increased to 134,704 passengers and 245 trains were run. A still greater number was handled on August 3, when 135,619 passengers were carried, although the number of trains operated was decreased to 243, while on August 4, the number of patrons carried was 134,822, and 242 trains were run. The Illinois Central averaged 73,500 suburban passengers daily before the strike with 378 trains. On August 1, this number was increased to 132,576 passengers and 592 trains, while on August 2, there were 146,124 passengers and 594 trains; August 3, 151,787 passengers and 610 trains; August 4, 157,022 passengers and 616 trains; and on August 5, there were 157,517 passengers and 612 trains. The Chicago, Rock Island & Pacific, which normally carries 30,000 suburban passengers, increased this number by 50 per cent after the first day of the strike. The Chicago, Milwaukee & St. Paul added 17 trains while the Chicago & Western Indiana increased its number by 15. The strike ended Sunday noon and on Monday the suburban service was approximately normal, although a great number of the strike patrons were still making use of their commutation tickets.

Collision on the Cincinnati, Lebanon & Northern

In a collision of passenger trains on the Cincinnati, Lebanon & Northern, at Pleasant Ridge, Ohio, seven miles north of Cincinnati, on August 1, three passengers and two employees were killed and three or more passengers and two employees were injured. The trains were northbound regular passenger No. 11 and a southbound excursion train. It is said that the excursion train disregarded the rule requiring it to keep clear of the regular train.

Photo by International

Shortly After the Accident on the C., L. & H.

A press dispatch from Moscow says that the offices of the Canadian Pacific Railway and the White Star Steamship line in that city have been reopened. These offices were closed by the Soviet Government and their restoration is said to have been due to representations made by the British Mission.

Traffic News

P. R. Thompson has resigned as traffic manager of the Pacific Coast Steel Company to become chairman of the transportation committee of the Peninsular Bureau of Chambers of Commerce and Civic Associations, with headquarters at Redwood City, Cal.

The Canadian roads—the Grand Trunk and the Canadian Pacific—have voluntarily accepted the terms of the order of the Interstate Commerce Commission under which, on western freight billed through to and from New England, the proportions allowed to the New England roads are to be 15 per cent more than heretofore. The Canadian roads were not parties to the case before the commission.

Potato Business on the Pennsylvania

The Pennsylvania Railroad reports that the white potato crop of the Maryland-Delaware-Virginia Peninsula, from Cape Charles, Va., to Wilmington, Del., has this year broken all previous records for both production and shipments, the total movement amounting to 16,019 carloads, an increase of 10 per cent over the previous high record. Most of the crop goes to Philadelphia, New York City and New England and to the Central Western region between Pittsburgh, Chicago and St. Louis. This year about 60 per cent of the crop went east and 40 per cent west. Nearly 20 per cent of the entire crop went into New England, an unusually large proportion.

On the heaviest single day, July 12, 661 carloads were forwarded. The car supply this year was entirely adequate. The shopmen's strike was on during the greater part of the shipping period, but neither the car supply nor the handling of the loaded cars was interfered with in the slightest degree. About 8,000 box cars were required to handle the crop, each car averaging two round trips between shipping point and market.

Coal Production

A slight increase in output marked the eighteenth week of the coal strike (July 31-August 5). Preliminary returns compiled by the Geological Survey indicate a production of 4,250,000 tons of soft coal against 3,933,000 tons in the week before. The increase is said to be due to improved car supply in the Middle Appalachian Fields rather than to reopening of mines hitherto closed by the strike.

In spite of the increase in bituminous output, the eighteenth week finds production still about 1,100,000 tons short of the level reached before the shopmen's strike, for in the week ending June 24, 5,337,000 tons were raised.

Production of anthracite in the eighteenth week will be barely 30,000 tons.

The trend of production is shown in the cars loaded daily by the railroads. Loadings on Monday, July 31, were 14,768 cars, an increase over the preceding Monday of 11 per cent. The following day the total dropped to 11,783 cars, partly because of pay day. A partial recovery carried loadings on Wednesday up to 12,218 cars, and on Thursday 12,177 cars were loaded.

Detailed records of shipments from each district indicate that up to the present, mines responding to the invitation to resume operations have added little to the coal supply of the country. There has been practically no increase in output in any of the strongly organized districts, and the increase in shipments from Pennsylvania, and from the Fairmont and Kanawha districts has not been large.

The mine reports for the week ended July 22 picture conditions at the mines when the railway shopmen's strike was at its height. Congestion at important rail gateways grew worse and practically every field east of the Mississippi now producing reported increased losses through transportation. In Hazard, Western Kentucky, and Southern West Virginia working time steadily decreased as rail difficulties increased.

The loss ascribed to transportation in Colorado was confined to mines in Routt County, which reports unavoidable suspension of service on one railroad.

Commission and Court News

Interstate Commerce Commission

The commission has issued a decision amending after further hearings its findings in the western hay and grain rate case so as to eliminate from the findings of the original report interstate carload rates on grain, grain products and hay between points within that portion of Illinois territory included in the western group.

The Interstate Commerce Commission has issued its decision holding that the surcharge for passengers in sleeping and parlor cars which was applied to interstate traffic by its order in Ex Parte 74 should be applied intrastate in Georgia. The surcharge was put into effect on September 1, 1920, in Georgia, with the approval of the Georgia commission, but after a hearing it ordered the cancellation of the surcharge effective on December 20, 1921, and since that time it has not been applied to intrastate business.

Court News

Carrier Operating Two Lines Not Necessarily Bound to Ship by the Cheaper

Following Northern Pacific v. Solcarn, 247 U. S. 477, the Springfield Court of Appeals holds that where a carrier is operating two lines between the same points, and the rate over one is less than the rate over the other, it is ordinarily the duty of the carrier to ship by the cheaper route. This duty is not absolute, however. The carrier is not bound to consider only the shipper's interest, but should consider the interest of the public and its own; and if, all things considered, it would be unreasonable to ship by the cheaper route, the carrier is not required to do so.—Stroud v. M. P. (Mo. App.), 236 S. W. 891.

Shifting Cars After End of Journey Not Interstate Commerce

Three cars with coal from Pennsylvania to Canandaigua, N. Y., were placed on the consignee's siding and two were unloaded. The middle car was in such a position that it could not conveniently be unloaded. The yard crew proceeded to readjust the position of this car and to take away the empty cars. While coupling the engine to the cars the conductor was injured because, it was claimed, of defective automatic couplers. The New York Appellate Division holds that this was not a movement of cars in interstate commerce; and there could be no recovery, under the federal act, for his death. Camp v. Pennsylvania, 193 N. Y. Supp. 31.

Coal Refused May Not Be Kept on Cars Long

The initial carrier of a shipment of coal quoted the rate charged by other carriers, but on arrival at destination it was found its tariff rate was higher. The consignee refused to accept the coal, which the railroad kept in the cars for six months and then sold for about half the freight and demurrage charges. The railroad sued for these charges; the consignee claimed that the sale of the coal was conversion entitling it to damages. The Wisconsin Supreme Court held that it is the duty of a carrier, when freight has not been disposed of within a reasonable time, to unload and store it for account of the owner; that the railroad, under this rule, was not entitled to demurrage beyond a reasonable time, that ten days was a reasonable time, and that in view of the railroad's long delay in acting after knowledge of the consignee's refusal to accept the coal, judgment for damages for conversion was warranted. The court said that, while it might have been better business management for the consignee to accept the coal, pay the illegal rate, and afterwards seek his remedy, he was under no obligation to do so. In determining the damages, the unpaid freight charges must be deducted from the market value of the coal at destination.—Waters v. Becker (Wis.), 186 N. W. 167.

Labor Board Decisions

Employees of Freight House Contractor Under Jurisdiction of Labor Board

On February 26, 1922, the Cleveland, Cincinnati, Chicago & St. Louis turned the operation of its freight house at Indianapolis over to the A. S. Hecker Company, who immediately reduced the rates of pay of employees engaged in freight handling below those established by the Railroad Labor Board. The arguments advanced by the railroad and by the employees in this case were similar to those put forth in earlier cases governing contracting of shop and track operations. The Board decided that this contract is in violation of the Transportation Act, and that the freight house employees of the contractor are under the jurisdiction of the Labor Board and subject to the application of the Transportation Act; and the carrier was directed to take up with any employee the matter of his reinstatement upon application.—(*Decision No.* 1119.)

Green Bay & Western a Class I Carrier

Sixteen employees' organizations petitioned the Railroad Labor Board for the application of Decision No. 2 to the employees of the Green Bay & Western, after this road had participated in the hearing on an increase in wages for employees of the short line railroads. The employees contended that this road was not a short line railroad but a class I carrier as its operating revenues exceed $1,000,000 a year. The employees claimed that there are 53 class I roads with less mileage than the Green Bay & Western, that 26 have less capital stock, that 32 have fewer freight cars, that 33 have fewer locomotives, and that 29 carry less freight. The railway management maintained that the petition should be dismissed because the road had been a party to the short line hearing which resulted in the issuance of Decision No. 108 and that the employees' requests are exactly the same as those that were dismissed in that decision. The Labor Board decided that the Green Bay & Western is a Class I road, and that its characteristics are of a nature which exclude it from the class of short line roads. It therefore decided that the rates of pay of the employees shall be adjusted on the basis of the increase awarded in Decision No. 2, and the decrease specified in Decision No. 147, and that this decision shall be effective as of May 1, 1922.—(*Decision No.* 1123.)

One Organization to Represent Employees

For several years rules governing the rates of compensation and service of engine house employees and fuel handlers on the terminal division of the Boston & Maine have been made by agreement between the managemnt and a committee affiliated with the Knights of Labor. Since September 1, 1917, the rules covering store department employees in oil rooms and enginehouse storerooms on the Boston Terminal have been negotiated between the management and a similar committee. Under Decision No. 119, and especially principle 15 in Exhibit "B" of that decision, the railway management has considered as one class all laborers in and around shops, enginehouses and storehouses; and has found by vote of the employees that a majority of this class, taking the railroad as a whole, desired to have the United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers represent them. The management accordingly proceeded to negotiate an agreement with a committee from that organization. The employees on the Terminal division contended that the separate agreement with the Knights of Labor should continue. The Labor Board decided that the management acted properly in negotiating an agreement with the maintenance of way organization. This decision, however, does not prevent employees from designating representatives of their choice to handle with the management matters affecting their wages and working conditions, provided such procedure is in conformity with the rules incorporated in the agreement entered into with the maintenance of way organization and the provisions of the Transportation Act.—(*Decision No.* 1121.)

Foreign Railway News

Electric Trains in Euston Station

The London & North Western is now running electric suburban trains into Euston station, its London terminus. This event marks the completion of an intensive development of an important suburban area in the neighborhood of London. The electrification involved a considerable amount of construction, including two tunnels, several new stations, the separation of grades at a junction where there were 17 running tracks and some heavy track construction.

British Interests Push Plan for Construction of Short Line from Tampico to Mexico City

Engineers are making final surveys for the railroad which the British interests which own the Mexican (Vera Cruz) Railway are to build from a connection with the former Hidalo & Northeastern near Cachuca to Tampico. The concession for constructing this line was granted by the Mexican government a few months ago. It is stated that all necessary financial arrangements for the rapid building of the road have been made. It will form a direct short line between Tampico and Mexico City and will follow practically the same route that was selected by engineers for the road which had been started by the National Railways of Mexico at the time the revolutionary period began nearly twelve years ago.

Westinghouse Ships Second Consignment for Chile's Electrification

A second train of electrical equipment for Chile, a part of the Westinghouse Electric & Manufacturing Company's $7,000,000 contract, left the company's East Pittsburgh plant last week. The first trainload of electrical equipment for Chile was illustrated in the *Railway Age* of July 22, page 177.

This second train was dubbed the "International Trade Special" and is shown in an accompanying illustration with a Chilean locomotive on standard gage trucks at the head. No locomotives have been shipped on this order as yet, however, but this movement will begin shortly. The contract calls for the delivery of 39 locomotives.

The equipment shipped in this consignment included 2,000 k.w. motor generator sets for installation in three sub-stations under construction at Vina del Mar, San Pedro and Llai Llai; transformers, switching equipment for three sub-stations, 15 lightning arresters, three switchboards of 20 panels each and 44 circuit breakers.

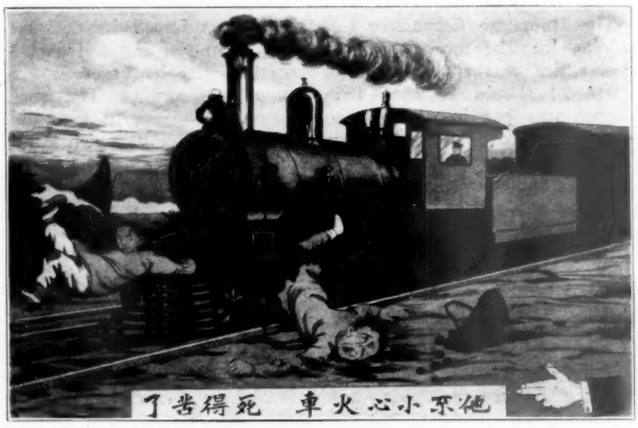
New Locomotives for Swiss Federal Railways

LONDON.

The Swiss Federal Railways have recently ordered from Swiss factories 20 electric express locomotives with a maximum speed of approximately 56 miles per hour. The locomotives will take about two years to build. During the next four to five years a total of about 100 new electric locomotives are to be built for the Federal Railways.

Safety First Movement in China

The accompanying illustration is the exact reproduction of "safety-first" posters which have been placed at all the important railroad grade crossings in China. The originals are mounted on



sheet metal so that they may withstand varying weather conditions. The picture, itself, which is vivid in its description as may be noticed, was so drawn that it might appeal to and be understood by the average Chinaman of ordinary intelligence who does not possess marked alertness or wit, or is yet trained to think for himself.

A Fifty-Mile Private Railroad in Mexico

One of the longest private mining railroads in Mexico is the Chihuahua & Oriente which was finished and placed in operation a few days ago. It was built by the Erupcion Mining Company and the Ahumada Lead Company and is 50 miles long. It connects the mines of these companies in the State of Chihuahua with the National Railways of Mexico and affords a direct shipping outlet for their ores. Before the construction of the line the ore output had to be hauled to the railroad shipping point by wagon. Mining operations of the two companies are being enlarged and two hundred tons of ore are being shipped daily to the smelter of the American Smelting & Refining Company at El Paso.

Train of Supplies for Chile With Chilean Locomotive at Head

Equipment and Supplies

Locomotives

THE INDIANAPOLIS UNION has ordered five 0-8-0 type switching locomotives from the Lima Locomotive Works.

THE POLISH STATE RAILWAYS have ordered 25 Consolidation type locomotives from the Baldwin Locomotive Works.

THE CANADIAN PACIFIC is constructing in its own shops three single track snow ploughs and one steel underframe flanger.

THE CHICAGO & NORTHWESTERN will receive bids until August 23 for 40 mikado type superheater locomotives and 10 Pacific type superheater locomotives.

THE NEW YORK, CHICAGO & ST. LOUIS, reported in the *Railway Age* of July 1 as having ordered 14 locomotives from the Lima Locomotive Works, has ordered five additional locomotives from the same builder.

THE E. S. TUBARAO A. ARARANGUA (BRAZIL) has ordered one mikado type of locomotive from the American Locomotive Company. This locomotive will have 16 by 22 in. cylinders and a total weight in working order of 115,000 lb.

THE PUBLIC SERVICE COMPANY OF NORTHERN ILLINOIS has ordered one 0-4-0 type switching locomotive from the American Locomotive Company. This locomotive will have 16 by 24 in. cylinders and a total weight in working order of 99,000 lb.

THE WHEELING STEEL AND IRON COMPANY, Wheeling W. Va., has ordered one 0-6-0 type switching locomotive from the American Locomotive Company. This locomotive will have 20 by 26 in. cylinders and a total weight in working order of 158,000 lb.

Freight Cars

THE UNITED SUGAR COMPANY is inquiring for 40 cane cars.

THE PACIFIC ELECTRIC is inquiring for 200 dump cars of 50 tons' capacity.

THE CANADIAN PACIFIC has ordered 250 refrigerator cars from the National Steel Car Corporation.

THE SEABOARD AIR LINE is having 900 box cars repaired at the shops of the Magor Car Corporation.

THE WILCOX COMPANY, Chicago, has ordered 50 hopper cars from the Western Steel Car & Foundry Co.

THE WHARTON & NORTHERN has ordered from the Clark Car Company 10, 30-yd. extension side dump cars.

THE WEST VIRGINIA PULP & PAPER COMPANY, New York City, is inquiring for 10 steel underframe box cars.

THE TENNESSEE, ALABAMA & GEORGIA is inquiring for 20, 50-ton box and 20, 50-ton composite gondola cars.

THE TEXAS COMPANY has ordered five tank cars of 5,000 gal. capacity from the Pennsylvania Tank Car Company.

THE MANATI SUGAR COMPANY, 112 Wall Street, New York City, has ordered 50 cane cars from the Magor Car Corporation.

THE SOUTH INDIAN RAILWAY is inquiring through the car builders for 60 ballast cars, broad gage, and 210 ballast cars of meter gage.

THE CHICAGO MILWAUKEE & ST. PAUL, reported in *Railway Age* July 15 as inquiring for repairs to a number of freight cars, is expected to place orders shortly.

THE CHICAGO & NORTH WESTERN is about to place an order for repairs to 500 box cars which is in addition to the order reported in the *Railway Age* of August 5.

THE WARNER SUGAR REFINING COMPANY, New York, has ordered for the Miranda Sugar Company 150 cane cars of 30 tons' capacity from the Magor Car Corporation.

THE JACOB DOLD PACKING COMPANY, Buffalo, N. Y., reported in the *Railway Age* of July 8 as inquiring for from 50 to 100 refrigerator cars of 30 tons' capacity, will build 35 refrigerator cars in its own shops.

THE CHESAPEAKE & OHIO, reported in the *Railway Age* of July 22 as inquiring for 50 refrigerator cars of 40 tons' capacity, has ordered this equipment from the American Car & Foundry Company and it will be built at the company's Berwick, Pa., plant.

THE GRAND TRUNK is having 100 refrigerator cars repaired at the shops of the National Steel Car Corporation. This road is also having repairs made to 500 coal cars and 500 box cars; the order being divided between the Canadian Car & Foundry Company and the Eastern Car Company.

THE CHICAGO, ROCK ISLAND & PACIFIC, reported in the *Railway Age* of July 15 as inquiring for repairs to a number of freight cars and the *Railway Age* of August 5 as having placed orders in part, has now ordered repairs to 1,500 composite National dump cars from the Western Steel Car & Foundry Company.

THE CHESAPEAKE & OHIO recently placed orders for repairing steel coal cars as follows: Illinois Car & Manufacturing Company, Hammond, Ind., 1,000 cars; Keith Railway Equipment Company, Hammond, Ind., 500 cars; American Car & Foundry Company, Huntington, West Va., 1,500 cars; and Richmond Car Works, Richmond, Va., 1,000 cars.

Passenger Cars

THE DIRECTOR GENERAL OF MAIL, MEXICAN GOVERNMENT, is inquiring for 15 mail cars.

THE CANADIAN PACIFIC has ordered 15 baggage cars from the National Steel Car Corporation.

THE ATCHISON, TOPEKA & SANTA FE has not yet placed an order for the 8 buffet library cars referred to in the *Railway Age* of July 1.

Track Specialties

THE MISSOURI PACIFIC is inquiring for 3,000 kegs of track spikes.

Machinery and Tools

THE LONG ISLAND has ordered from the Niles-Bement-Pond Company one 10-ton, 3-motor electric traveling crane.

Miscellaneous

THE CHICAGO UNION STATION is inquiring for 8 tractors and 200 trailers for use in the mail building.

Signaling

THE ILLINOIS CENTRAL has ordered from the Hall Switch & Signal Company 54 unit type three-color light signals.

THE EASTERN BENGAL RAILWAY, India, has ordered 406 relays from the Hall Switch & Signal Company, Gårwood, N. J.

THE ATCHISON, TOPEKA & SANTA FE has ordered from the Union Switch & Signal Company the material for 121 miles of automatic block signaling; 75 miles on the Coast Lines, color-light signals, style L, 3-color, and 46 miles on the Eastern Lines; semaphores, style T-2, top-post. These semaphores, 146 of them, will be installed between Dumas, Mo., and Medill, 11 miles; Melvern, Kan., and Ridgeton, 8 miles; Neosho Rapids, Kan., and Emporia Junction, 10 miles; Wagner, Kan., and Braddock, 10 miles, and between Walton, Kan., and Newton, 7 miles. The light signals are to be installed on the double-track line between Yampai, Ariz., and Griffith.

Supply Trade News

G. S. Bigelow, Chicago representative of the Mountain Varnish & Color Works, Toledo, Ohio, has resigned.

H. F. Barrus, sales manager of the Union Twist Drill Company Athol, Mass., has resigned to enter business in the firm of **Barrus & Cullen, Ltd.,** London, England.

W. E. Farnan has been appointed director of the special committee on railroad lumber requirements of the Southern Pine Association, with headquarters at New Orleans, La.

Monroe L. Patzig, 206 Eleventh street, Des Moines, Iowa, has been appointed representative of the **Conveyors Corporation of America,** Chicago. Mr. Patzig's territory is in Central Iowa.

The Klein-Logan Company, Pittsburgh, Pa., has recently opened an eastern sales office in the Woolworth building, New York City to handle railway track tools manufactured by this company.

The Franklin Moore Company, Winsted, Conn., manufacturers of material handling machinery for industrial plants has appointed the **Scheid Engineering Corporation,** 90 West street, New York City, as its metropolitan and export representatives.

The New York City office of the **Chicago Flexible Shaft Company,** Chicago, manufacturers of Stewart industrial furnaces, which has been located at 350 Broadway since it was established early in 1920, has been removed to 16 Reade street. The office, as before, is in charge of J. W. Lazear.

The King Pneumatic Tool Company has moved into a new factory at 1735 Armitage avenue, Chicago, with more than double the capacity of the former plant. The company manufactures molybdenum steel riveting hammers, chipping hammers, rivet cutters, electric drills, and a complete line of pneumatic tools and accessories.

J. J. Hennessy and Hugh Bonham have been appointed assistant superintendents of the lubrication division, railway traffic and sales department of the **Texas Company,** New York. Mr. Hennessy's appointment is for the eastern territory with headquarters at New York City and Mr. Bonham's for the western territory with headquarters at Chicago.

Trade Publications

ELIMINATING WASTE IN BLASTING.—A 48-page, illustrated, booklet has been issued recently by the Hercules Powder Company, Wilmington, Del., devoted to the question of eliminating waste in various forms of blasting. The text takes up in detail the important factors to be considered and in conjunction with numerous illustrations, describes how the work may be handled with economy. Among the chapters are several devoted to planning, drilling, choosing explosives, firing schedules and systems, etc.

ELECTRIC FANS FOR RAILWAY SERVICE.—"The Safety Fan" is the title of a 57-page catalogue recently issued by the Safety Car Heating & Lighting Company, 2 Rector street, New York. The catalogue describes and illustrates the fans for railway cars which are made by the Safety Company and also describes the manner in which the fans can be used to best advantage. A cross indexed table shows at a glance which of the parts of the several fans and speed controls are interchangeable.

WROUGHT IRON.—An interesting and well illustrated description of the manufacture of ordinary wrought iron and staybolt iron is contained in a booklet recently issued by the Penn Iron and Steel Company, Creighton, Pa. The book tells briefly the story of the first rolling of iron bars in America, which is followed by an account of the successive stages in the manufacture of the modern product. In addition to the illustrations of rolling mills and test pieces the book contains a table of the weights of round and square bars.

Railway Construction

BALTIMORE & OHIO.—This company has awarded a contract to the Seabord Construction Company, Philadelphia, for the elimination of a grade crossing with the Lincoln highway at Lumbrook, Del. The company's tracks are to be carried over the highway on a double-track, through plate girder span. The steel for the work was fabricated by the Fort Pitt Bridge Works.

CHICAGO, BURLINGTON & QUINCY.—This company has requested a permit in the city of Council Bluffs, Iowa, to construct a brick roundhouse in that city, of which five stalls will be constructed in the near future.

CHICAGO, ROCK ISLAND & PACIFIC.—This company is now preparing plans for the construction of a passenger station at Moline, Ill., which will have terra cotta walls, brick veneer base and tile roof, and will cost approximately $100,000.

CHICAGO UNION STATION.—This company will soon call for bids for the construction of a concrete trucking subway extending north of Harrison street, Chicago. The work will include three elevator pits and syphon basins and an extension to the Washington street tunnel of the Commonwealth Edison Company.

DAYTON, TOLEDO & CHICAGO.—This company, operating a railroad extending from Dayton, Ohio, north to Delphos, a distance of 95 miles, ceased operations on August 1. In a report to the post office department, W. H. Ogborn, receiver, stated that operations were discontinued "on account of defective bridges and tracks and the financial condition due to the strikes."

ILLINOIS CENTRAL.—This company, which was reported in the *Railway Age* of August 5 as calling for bids for the construction of water station, including a 100,000 gal. storage tank at Matteson, Ill., in connection with grade separation work at that point, has awarded a contract for this work to Joseph E. Nelson & Sons, Chicago. The company has awarded a contract to the Ellington-Miller Company, Chicago, for the masonry work for the Island Creek bridge included in the double tracking between Paducah, Ky., and Clark, which work will involve an expenditure of approximately $25,000; and is also inquiring for bids for alterations to its freight house at Indianapolis, including the construction of a new transfer platform and concrete pavement, this work having been noted in the *Railway Age* of July 15 as being contemplated.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company is calling for bids for an 18-stall brick roundhouse at Gladstone, Mich., to replace a structure recently destroyed by fire.

MISSOURI, KANSAS & TEXAS.—This company has awarded a contract to H. D. McCoy, Cleburne, Tex., for the construction of a freight house at Wichita Falls, Tex.

UNION PACIFIC.—This company will close bids August 23 for the remodeling of its passenger station and for the construction of a freight house at Sterling, Colo.

VENTILATION OF PASSENGER CARS might well engage the attention of the railway managers when they have a little leisure.

This is the season of that very serious affection, the "Summer cold," and particularly exposed to the malady are those daily travelers, the members of the commuting tribe. They arrive at the station in Summer more or less hot and moist. . . . No matter how much care they exercise, they are the helpless victims of the window next ahead of the one by which they place themselves, for it is a peculiarity of railway cars that the passenger gets the draft, not from his own window, but from that of his neighbor in front of him. Nobody, or almost nobody, gives a thought to what is suffered by the other person upon whom the gales blow. European cars, with windows that open from the top, instead of from the bottom, are better; they do not go down very far, and ventilation is effected without drafts being felt by anybody.—*New York Times.*

Railway Financial News

ALABAMA & MISSISSIPPI.—*Sold.*—The Alabama & Mississippi railroad, operating between Vinegar Bend, Ala., and Pasacola, Miss., a distance of 76 miles, was sold at auction on August 1, by order of the United States District Court. The purchase price was $142,365, and J. W. Backstrom, of Leakesville, Miss., and H. C. Turner, of Mobile, Ala., who have extensive mill interests in Greene county, Miss., through which that line passes, were the buyers. The railroad owns five locomotives, 24 freight cars and three passenger cars, and runs one train a day each way. It has been in receivership since March, 1921.

CHICAGO UNION STATION CO.—*Guaranty Not Applicable.*—The Interstate Commerce Commission has rendered a decision that the provisions of Section 209 of the transportation act providing for the guaranty for the six months' period of 1920 are not applicable to this company on the ground that its revenues were covered by those of the tenant lines. The property was operated during the guaranty period by the Pennsylvania Railroad as agent for the tenant companies.

COLORADO & SOUTHERN.—*Authority to Abandon Branch Denied.*—The Interstate Commerce Commission has denied the application of this company to abandon its Buena Vista-Romley branch, including certain mine trackage, making a total distance of 29.42 miles, on the ground that the abandonment would deprive a large section of the benefits of rail transportation and would probably result in the abandonment of the mining district and the loss of large investments heretofore made. While the operation of the line for the past four or five years has resulted in substantial losses, the commission says the record affords some assurance that the conditions which produced that result are changing and that future operations may show a more favorable return. If the improvement should not materialize within a reasonable time, the applicant may renew this application. The commission also says the offer of the company to lease the line to the shippers and others that protested against its abandonment at a rental of $5 a year should be given serious consideration.

NEW ORLEANS, TEXAS & MEXICO.—*Application for Authority to Acquire Control Denied.*—The Interstate Commerce Commission has denied this company's application for authority for the proposed acquisition of control of the Dayton-Goose Creek by purchase of its capital stock, as not being in the public interest.

NEW YORK, LACKAWANNA & WESTERN.—*Authorized to Issue Bonds.*—The Interstate Commerce Commission has authorized this company to issue $13,639,000 of first and refunding mortgage bonds to be delivered to the Delaware, Lackawanna & Western in reimbursement of advances and in payment of a note. The company was also authorized to issue $10,000,000 of first and refunding mortgage bonds or not exceeding $5,000,000 of stock and such amount of bonds as, together with the stock, will aggregate $10,000,000, to be sold or exchanged for the purpose of paying or refunding certain construction mortgage bonds and terminal and improved mortgage bonds. The Delaware, Lackawanna & Western was authorized to guarantee the bonds and stock.

PENNSYLVANIA RAILROAD.—*Assumes Operation of G. R. & I.*—Announcement is made that the Pennsylvania has taken over and assumed the actual operation of the Grand Rapids & Indiana Ry., in accordance with its lease of that property.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Asks Authority to Issue Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue $2,499,000 of general mortgage 4 per cent bonds to reimburse the treasury for expenditures. The bonds are not to be sold at present but are to be placed in the treasury.

VIRGINIAN & WESTERN.—*Authorized to Issue Bonds.*—This company has been authorized by the Interstate Commerce Commission to issue $1,500,000 of first mortgage 5 per cent gold bonds to be sold at not less than 95, the proceeds to be applied in part payment for advances by the Virginian.

Treasury Payments to Railroads

Since last announcement, dated July 1, 1922, payments under Sections 204, 209, 210 and 212 of the Transportation Act, 1920, as amended, have been made by the Treasury as follows:

Section 204:	
Butler County Railroad Co.	$18,078.37
Fernwood, Columbia & Gulf Railroad Co.	46,478.60
Knoxville, Sevierville & Gulf Railroad Co.	5,009.25
Lumpkin, Hemphill & Gulf Railway Co.	6,517.07
Mansfield Railway & Transportation Co.	14,802.09
Nacogdoches & Southeastern Railroad Co.	18,498.53
St. John & Ophir Railroad Co.	17,977.70
Section 209:	
Alabama Central Railway Company	2,246.20
Bloomsburg & Sullivan R. R. Co.	2,961.03
Brownwood North & South Railway Co.	1,051.27
Bennettsville & Cheraw Railroad Co.	6,319.94
Fernwood, Columbia & Gulf Railroad Co.	12,480.05
Fort Worth & Rio Grande Railway Co.	41,885.67
Illinois Central Railroad Co.	1,313,078.57
Kansas City, Clinton & Springfield Ry. Co.	31,228.29
Kansas City, Mexico & Orient Ry. Co. of Texas	84,715.19
Kansas City, Mexico & Orient R. R. Co., receiver	32,904.17
Middle Tennessee Railroad Co.	20,864.90
Port St. Joe Dock & Terminal Railway Co.	1,410.22
Quanah, Acme & Pacific Railway Co.	17,226.86
St. Louis, San Francisco & Texas Railway Co.	114,967.63
St. Louis-San Francisco Railway Co.	855,449.76
Section 210:	
Cisco & Northeastern Railway Co.	27,863.00
Tennessee Central Railway Co.	563,000.00
Section 212:	
Port Bolivar Iron Ore Railway Co.	4,000.00
Total	$3,261,014.36

The total payments to July 31, 1922, have been:

(a)	Under Section 204, as amended by Section 212 for reimbursement of deficits during Federal control:		
	(1) Final payments, including partial payments previously made	$2,789,007.82	
	(2) Partial payments to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	1,201,603.54	
	Total payments a/c reimbursement of deficits		$3,990,611.36
(b)	Under Section 209, as amended by Section 212 for guaranty in respect to railway operating income for first six months after Federal control:		
	(1) Final payments, including advances and partial payments previously made	$91,201,862.25	
	(2) Advances to carriers as to which a certificate for final payment has not been received by the Treasury from the Interstate Commerce Commission	222,102,672.00	
	(3) Partial payments to carriers as to which a certificate for final payment has not been received, as stated above	132,281,922.09	
	Total payments account of said guaranty		445,586,456.34
(c)	Under Section 210 for loans from the revolving fund of $300,000,000 therein provided		314,693,943.00
	Total		$764,271,010.70

Repayments of loans have been made by 31 roads to the amount of $81,363,500.

Trend of Railway Stock and Bonds Prices

	Aug. 8	Last Week	Last Year
Average price of 20 representative railway stocks	70.72	68.98	56.04
Average price of 20 representative railway bonds	88.71	88.36	76.15

SEVERAL HUNDRED EMPLOYEES of the Pullman Company recently entered a competition for the best definition of the word "courtesy." The three prize winning definitions are as follows: First prize, $50—Courtesy consists of giving those we meet such considerate attention that their every want will be satisfied, and that they will realize the attention is due to real interest in their comfort; second, $35—Courtesy is the spirit and essence of service, kindness and good will. The cheery word, the friendly smile, the helping hand—these are handmaidens. It is born of a gentle mind and fostered by tact; third, $15—Do all the good you can, to all the people you can, whenever you can and as promptly and politely as you can.

Railway Officers

Financial, Legal and Accounting

Z. G. Hopkins, assistant to the chief officer of the Missouri, Kansas & Texas, has been appointed manager of the newly created department of public relations, with headquarters at St. Louis, Mo., effective Aug. 1.

Traffic

J. J. Finney has been appointed chief of the tariff bureau of the El Paso & Southwestern, effective August 1.

F. S. Brooks, assistant general livestock agent of the Chicago, Rock Island and Pacific with headquarters at Kansas City, has been promoted to general livestock agent of that road with headquarters at Chicago. He will be succeeded by **A. Peterson,** division freight and passenger agent, with headquarters at Amarillo, Texas.

R. H. Miller, traveling passenger agent of the Chicago & North Western with headquarters at Buffalo, N. Y., has been promoted to general agent with the same headquarters, effective August 1, with charge over the newly established offices of the company in that city. Effective the same date. **W. W. Pontius,** city agent at Cleveland, and **J. P. Fox** have been appointed traveling passenger agents.

Engineering, Maintenance of Way and Signaling

W. P. Wiltsee, assistant engineer of the Norfolk & Western, with headquarters at Roanoke, Va., who has been promoted to principal assistant engineer with the same headquarters, was born on May 30, 1878, at Cincinnati and entered railway service in 1895 as rodman with N. D. Burke, consulting engineer at Cincinnati. He was engaged in municipal and railroad work until 1899, when he entered the employ of the government as a draftsman and instrumentman on river and harbor work. In 1900 he re-entered railway service as assistant engineer of construction and maintenance of the Cincinnati, Portsmouth & Virginia (Norfolk & Western) and in 1901 joined the Norfolk & Western as a draftsman in the office of the engineer maintenance of way and served successively as chief draftsman in the office of the engineer of construction from 1902 to 1903 and as assistant engineer on branch line developments from 1903 to 1912. On the later date he was placed in charge of extensive tidewater improvements at Norfolk and related work. He was employed in this capacity until 1916 when he was appointed assistant engineer in the office of the chief engineer in charge of engineering matters connected with maintenance of way, water supply, fuel stations, etc., which position he held until the time of his recent promotion.

W. P. Wiltsee

General

W. E. Williams has been appointed manager of the newly created department of personnel of the Missouri, Kansas & Texas, with headquarters at St. Louis, Mo.

Obituary

Burton Hanson, for the past 12 years general counsel of the Chicago, Milwaukee & St. Paul, died on August 5 at the Presbyterian hospital, Chicago, from the effects of a minor operation performed July 24, from which he was making good recovery until August 4. Mr. Hanson was born on August 27, 1851, at Rushford, Winnebago county, Wis., and was educated at the Wisconsin State Normal School at Whitewater, Wis. Following the completion of his studies, he began the reading of law in the firm of Carey & Cotterill at Milwaukee. At that time the senior partner of this firm represented the Milwaukee & Northern (now the Superior division of the Chicago, Milwaukee & St. Paul) as solicitor, and in 1879 Mr. Hanson, then also a partner in the firm, was appointed assistant solicitor. He held this position until September 1, 1883, when he relinquished his connection with the Milwaukee & Northern to become assistant general solicitor on the Chicago, Milwaukee & St. Paul, in the service of which he was promoted to general solicitor on September 15, 1895. Mr. Hanson then continued as general solicitor until January 1, 1911, when he was elected general counsel, and was actively engaged in this capacity up to his recent illness.

Burton Hanson

C. W. Jones, manager of the first district of the Chicago, Rock Island & Pacific, with headquarters at Des Moines, Iowa, died in that city on July 22 after a long illness. Mr. Jones was born on November 6, 1860, at Milton, Ind., and entered railway service in 1875 as an agent's helper on the Chicago, Rock Island & Pacific. He was employed successively as telegraph operator from 1877 to 1881; agent and operator from 1881 to 1884, and train dispatcher from 1884 to 1890. In 1890 he was promoted to chief train dispatcher and in 1892, to trainmaster. He was employed in the latter capacity until February, 1895, when he was promoted to assistant superintendent which position he held until August, 1895, when he was promoted to division superintendent, with headquarters at Herington, Kan. He was superintendent of the Eastern division, with headquarters at Horton, Kan., from October, 1897, to May, 1902, and superintendent of the Kansas division with headquarters at Topeka, Kan., from May, 1902, to August, 1905. On the latter date he was transferred to the Iowa division with headquarters at Des Moines, Iowa, which position he held until January 1, 1909, when he was promoted as general superintendent with headquarters at Topeka, Kan. On December 15, of the latter year, he was promoted to general superintendent, with headquarters at Davenport, Iowa, and on February 1, 1912, he was promoted to general manager of the third district of the Chicago, Rock Island & Pacific, and vice-president and general manager of the Chicago, Rock Island & Gulf, with headquarters at Fort Worth, Texas, which position he held until January 1, 1914, when he was transferred to Des Moines.

C. W. Jones